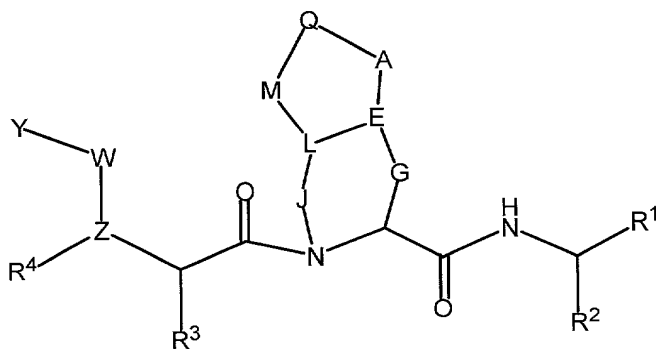


### Claims

What is claimed is:

1. A compound, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said compound, and pharmaceutically acceptable salts or solvates of said compound, or of said prodrug, said compound having the general structure shown in Formula I:



Formula I

wherein:

Y is selected from the group consisting of the following moieties: alkyl, alkyl-aryl, heteroalkyl, heteroaryl, aryl-heteroaryl, alkyl-heteroaryl, cycloalkyl, alkyloxy, alkyl-aryloxy, aryloxy, heteroaryloxy, heterocycloalkyloxy, cycloalkyloxy, alkylamino, arylamino, alkyl-aryl amino, arylamino, heteroaryl amino, cycloalkyl amino and heterocycloalkyl amino, with the proviso that Y maybe optionally substituted with X<sup>11</sup> or X<sup>12</sup>;

X<sup>11</sup> is alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkyl-alkyl, heterocyclyl, heterocyclylalkyl, aryl, alkylaryl, arylalkyl, heteroaryl, alkylheteroaryl, or heteroarylalkyl, with the proviso that X<sup>11</sup> may be additionally optionally substituted with X<sup>12</sup>;

X<sup>12</sup> is hydroxy, alkoxy, aryloxy, thio, alkylthio, arylthio, amino, alkylamino, arylamino, alkylsulfonyl, arylsulfonyl, alkylsulfonamido, arylsulfonamido, carboxy, carbalkoxy, carboxamido, alkoxycarbonylamino, alkoxycarbonyloxy, alkylureido,

arylureido, halogen, cyano, or nitro, with the proviso that said alkyl, alkoxy, and aryl may be additionally optionally substituted with moieties independently selected from  $X^{12}$ ;

$R^1$  is  $COR^5$  or  $B(OR)_2$ , wherein  $R^5$  is H, OH,  $OR^8$ ,  $NR^9R^{10}$ ,  $CF_3$ ,  $C_2F_5$ ,  $C_3F_7$ ,

5  $CF_2R^6$ ,  $R^6$ , or  $COR^7$  wherein  $R^7$  is H, OH,  $OR^8$ ,  $CHR^9R^{10}$ , or  $NR^9R^{10}$ ,

wherein  $R^6$ ,  $R^8$ ,  $R^9$  and  $R^{10}$  are independently selected from the group consisting of H, alkyl, aryl, heteroalkyl, heteroaryl, cycloalkyl, cycloalkyl, arylalkyl, heteroarylalkyl,  $[CH(R^{1'})]_pCOOR^{11}$ ,  $[CH(R^{1'})]_pCONR^{12}R^{13}$ ,  $[CH(R^{1'})]_pSO_2R^{11}$ ,  $[CH(R^{1'})]_pCOR^{11}$ ,  $[CH(R^{1'})]_pCH(OH)R^{11}$ ,

10  $CH(R^{1'})CONHCH(R^{2'})COOR^{11}$ ,  $CH(R^{1'})CONHCH(R^{2'})CONR^{12}R^{13}$ ,

$CH(R^{1'})CONHCH(R^{2'})R'$ ,  $CH(R^{1'})CONHCH(R^{2'})CONHCH(R^{3'})COOR^{11}$ ,

$CH(R^{1'})CONHCH(R^{2'})CONHCH(R^{3'})CONR^{12}R^{13}$ ,

$CH(R^{1'})CONHCH(R^{2'})CONHCH(R^{3'})CONHCH(R^{4'})COOR^{11}$ ,

$CH(R^{1'})CONHCH(R^{2'})CONHCH(R^{3'})CONHCH(R^{4'})CONR^{12}R^{13}$ ,

15  $CH(R^{1'})CONHCH(R^{2'})CONHCH(R^{3'})CONHCH(R^{4'})CONHCH(R^{5'})COOR^{11}$

and  $CH(R^{1'})CONHCH(R^{2'})CONHCH(R^{3'})CONHCH(R^{4'})CONHCH(R^{5'})$

$CONR^{12}R^{13}$ , wherein  $R^{1'}$ ,  $R^{2'}$ ,  $R^{3'}$ ,  $R^{4'}$ ,  $R^{5'}$ ,  $R^{11}$ ,  $R^{12}$ ,  $R^{13}$ , and  $R'$  are

independently selected from the group consisting of H, alkyl, aryl, heteroalkyl, heteroaryl, cycloalkyl, alkyl-aryl, alkyl-heteroaryl, aryl-alkyl and heteroaralkyl;

20  $Z$  is selected from O, N, CH or CR;

$W$  maybe present or absent, and if  $W$  is present,  $W$  is selected from  $C=O$ ,  $C=S$ ,  $C(=N-CN)$ , or  $SO_2$ ;

$Q$  maybe present or absent, and when  $Q$  is present,  $Q$  is CH, N, P,  $(CH_2)_p$ ,

25  $(CHR)_p$ ,  $(CRR')_p$ , O, NR, S, or  $SO_2$ ; and when  $Q$  is absent,  $M$  may be present or absent; when  $Q$  and  $M$  are absent,  $A$  is directly linked to  $L$ ;

$A$  is O,  $CH_2$ ,  $(CHR)_p$ ,  $(CHR-CHR')_p$ ,  $(CRR')_p$ , NR, S,  $SO_2$  or a bond;

$E$  is CH, N, CR, or a double bond towards  $A$ ,  $L$  or  $G$ ;

G may be present or absent, and when G is present, G is  $(CH_2)_p$ ,  $(CHR)_p$ , or  $(CRR')_p$ ; and when G is absent, J is present and E is directly connected to the carbon atom in Formula I as G is linked to;

J may be present or absent, and when J is present, J is  $(CH_2)_p$ ,  $(CHR)_p$ , or  $(CRR')_p$ ,  $SO_2$ ,  $NH$ ,  $NR$  or  $O$ ; and when J is absent, G is present and E is directly linked to N shown in Formula I as linked to J;

L may be present or absent, and when L is present, L is  $CH$ ,  $CR$ ,  $O$ ,  $S$  or  $NR$ ; and when L is absent, then M may be present or absent; and if M is present with L being absent, then M is directly and independently linked to E, and J is directly and independently linked to E;

M may be present or absent, and when M is present, M is  $O$ ,  $NR$ ,  $S$ ,  $SO_2$ ,  $(CH_2)_p$ ,  $(CHR)_p$ ,  $(CHR-CHR')_p$ , or  $(CRR')_p$ ;

p is a number from 0 to 6; and

R, R', R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> are independently selected from the group consisting of H;

C<sub>1</sub>-C<sub>10</sub> alkyl; C<sub>2</sub>-C<sub>10</sub> alkenyl; C<sub>3</sub>-C<sub>8</sub> cycloalkyl; C<sub>3</sub>-C<sub>8</sub> heterocycloalkyl, alkoxy, aryloxy, alkylthio, arylthio, amino, amido, ester, carboxylic acid, carbamate, urea, ketone, aldehyde, cyano, nitro, halogen; (cycloalkyl)alkyl and (heterocycloalkyl)alkyl, wherein said cycloalkyl is made of three to eight carbon atoms, and zero to six oxygen, nitrogen, sulfur, or phosphorus atoms, and said alkyl is of one to six carbon atoms; aryl; heteroaryl; alkyl-aryl; and alkyl-heteroaryl;

wherein said alkyl, heteroalkyl, alkenyl, heteroalkenyl, aryl, heteroaryl, cycloalkyl and heterocycloalkyl moieties may be optionally and chemically-suitably substituted, with said term "substituted" referring to optional and chemically-suitable substitution with one or more moieties selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, aralkyl, cycloalkyl, heterocyclic, halogen, hydroxy, thio, alkoxy, aryloxy, alkylthio, arylthio, amino, amido, ester, carboxylic acid, carbamate, urea, ketone, aldehyde, cyano, nitro, sulfonamido, sulfoxide, sulfone, sulfonyl urea, hydrazide, and hydroxamate;

further wherein said unit N-C-G-E-L-J-N represents a five-membered or six-membered cyclic ring structure with the proviso that when said unit N-C-G-E-L-J-N represents a five-membered cyclic ring structure, or when the bicyclic ring structure in Formula I comprising N, C, G, E, L, J, N, A, Q, and M represents a five-membered cyclic ring structure, then said five-membered cyclic ring structure lacks a carbonyl group as part of the cyclic ring.

2. The compound of claim 1, wherein  $R^1$  is  $COR^5$ , and  $R^5$  is H, OH,  $COOR^8$ ,  $CONR^9R^{10}$ .

3. The compound of claim 2, wherein  $R^1$  is  $COCONR^9R^{10}$ , and  $R^9$  is H,  $R^{10}$  is H,  $R^{14}$ ,  $[CH(R^1)]_pCOOR^{11}$ ,  $[CH(R^1)]_pCONR^{12}R^{13}$ ,  $[CH(R^1)]_pSO_2R^{11}$ ,  $[CH(R^1)]_pSO_2N R^{12}R^{13}$ ,  $[CH(R^1)]_pCOR^{11}$ ,  $CH(R^1)CONHCH(R^2)COOR^{11}$ ,  $CH(R^1)CONHCH(R^2) CONR^{12}R^{13}$ , or  $CH(R^1)CONHCH(R^2)(R')$ , wherein  $R^{14}$  is H, alkyl, aryl, heteroalkyl, heteroaryl, cycloalkyl, alkyl-aryl, alkyl-heteroaryl, aryl-alkyl, alkenyl, alkynyl or heteroaralkyl.

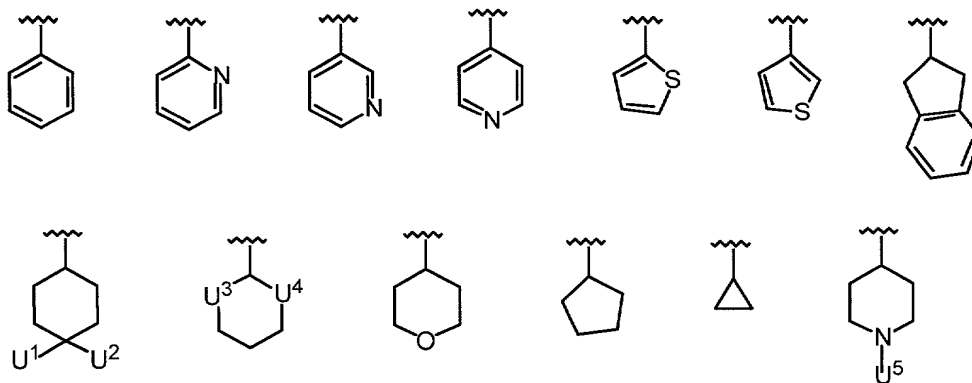
4. The compound of claim 3, wherein  $R^{10}$  is H,  $R^{14}$ ,  $CH(R^1)COOR^{11}$ ,  $CH(R^1)CH(R^1)COOR^{11}$ ,  $CH(R^1)CONR^{12}R^{13}$ ,  $CH(R^1)CH(R^1)CONR^{12}R^{13}$ ,  $CH(R^1)CH(R^1)SO_2R^{11}$ ,  $CH(R^1)CH(R^1)SO_2N R^{12}R^{13}$ ,  $CH(R^1)CH(R^1)COR^{11}$ ,  $CH(R^1)CONHCH(R^2)COOR^{11}$ ,  $CH(R^1)CONHCH(R^2) CONR^{12}R^{13}$ , or  $CH(R^1)CONHCH(R^2)(R')$ , wherein  $R^1$  is H or alkyl, and  $R^2$  is phenyl, substituted phenyl, hetero atom-substituted phenyl, thiophenyl, cycloalkyl, piperidyl or pyridyl.

5. The compound of claim 4, wherein  $R^{11}$  is H.

6. The compound of claim 5, wherein  $R^{11}$  is H, methyl, ethyl, allyl, *tert*-butyl, benzyl,  $\alpha$ -methylbenzyl,  $\alpha,\alpha$ -dimethylbenzyl, 1-methylcyclopropyl or 1-methylcyclopentyl;

$R'$  is hydroxymethyl or  $CH_2CONR^{12}R^{13}$ ;

$R^2$  is independently selected from the group consisting of:



wherein:

U<sup>1</sup> and U<sup>2</sup> maybe same or different and are selected

from H, F, CH<sub>2</sub>COOH, CH<sub>2</sub>COOMe, CH<sub>2</sub>CONH<sub>2</sub>,

CH<sub>2</sub>CONHMe, CH<sub>2</sub>CONMe<sub>2</sub>, azido, amino, hydroxyl,

substituted amino, substituted hydroxyl;

U<sup>3</sup> and U<sup>4</sup> maybe same or different and are selected

from O and S;

U<sup>5</sup> is selected from the moieties consisting of alkyl

sulfonyl, aryl sulfonyl, heteroalkyl sulfonyl, heteroaryl

sulfonyl, alkyl carbonyl, aryl carbonyl, heteroalkyl

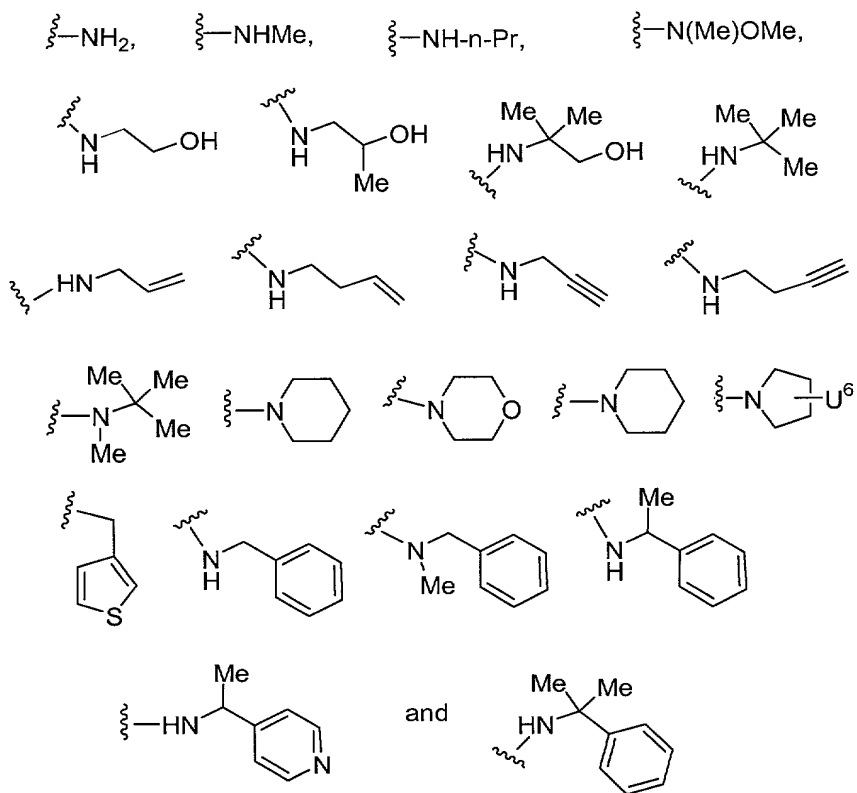
carbonyl, heteroaryl carbonyl, alkoxycarbonyl,

aryloxycarbonyl, heteroaryloxycarbonyl,

alkylaminocarbonyl, arylaminocarbonyl,

heteroarylamino carbonyl or a combination thereof;

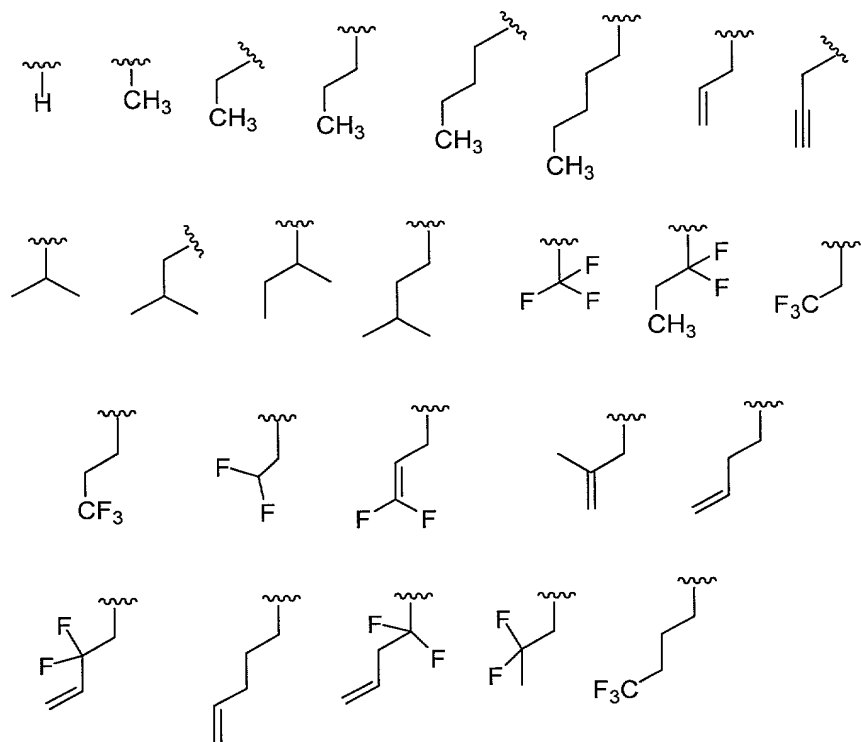
and NR<sup>12</sup>R<sup>13</sup> is selected from the group consisting of:

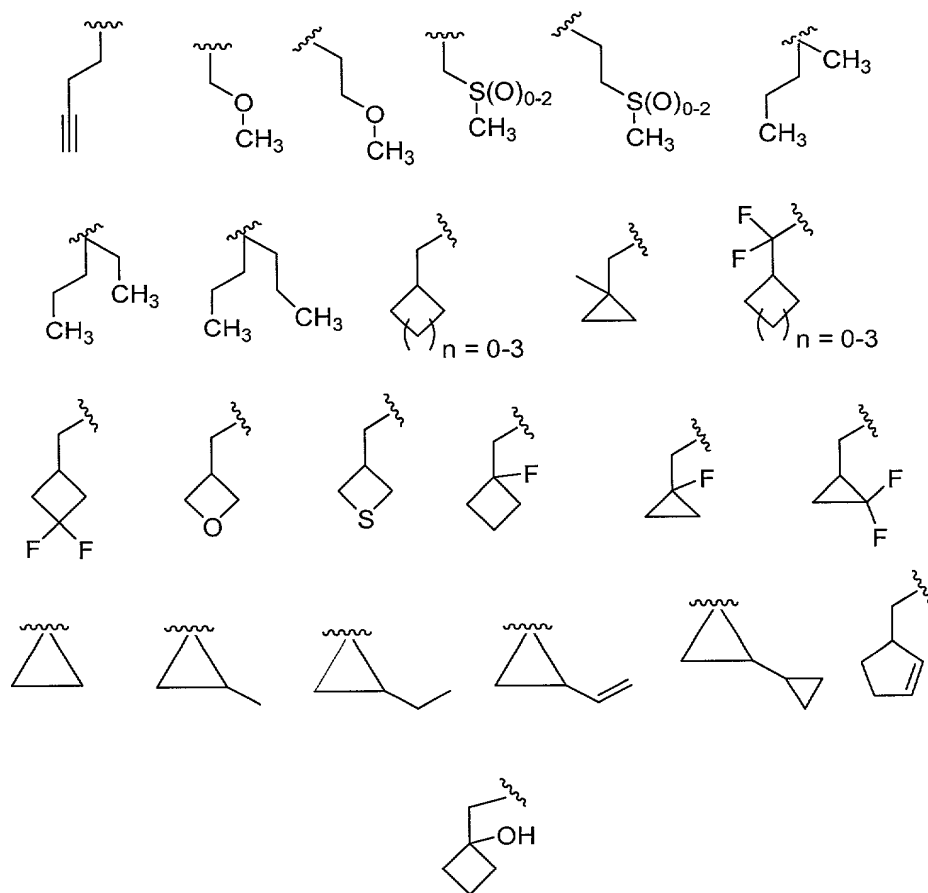


wherein  $\text{U}^6$  is H, OH, or  $\text{CH}_2\text{OH}$ , and

$\text{R}^{14}$  is selected from the group consisting of: H, Me, Et, *n*-propyl, methoxy,  
 5 cyclopropyl, *n*-butyl, 1-but-3-ynyl, benzyl,  $\alpha$ -methylbenzyl, phenethyl, allyl, 1-but-3-enyl, OMe, cyclopropylmethyl.

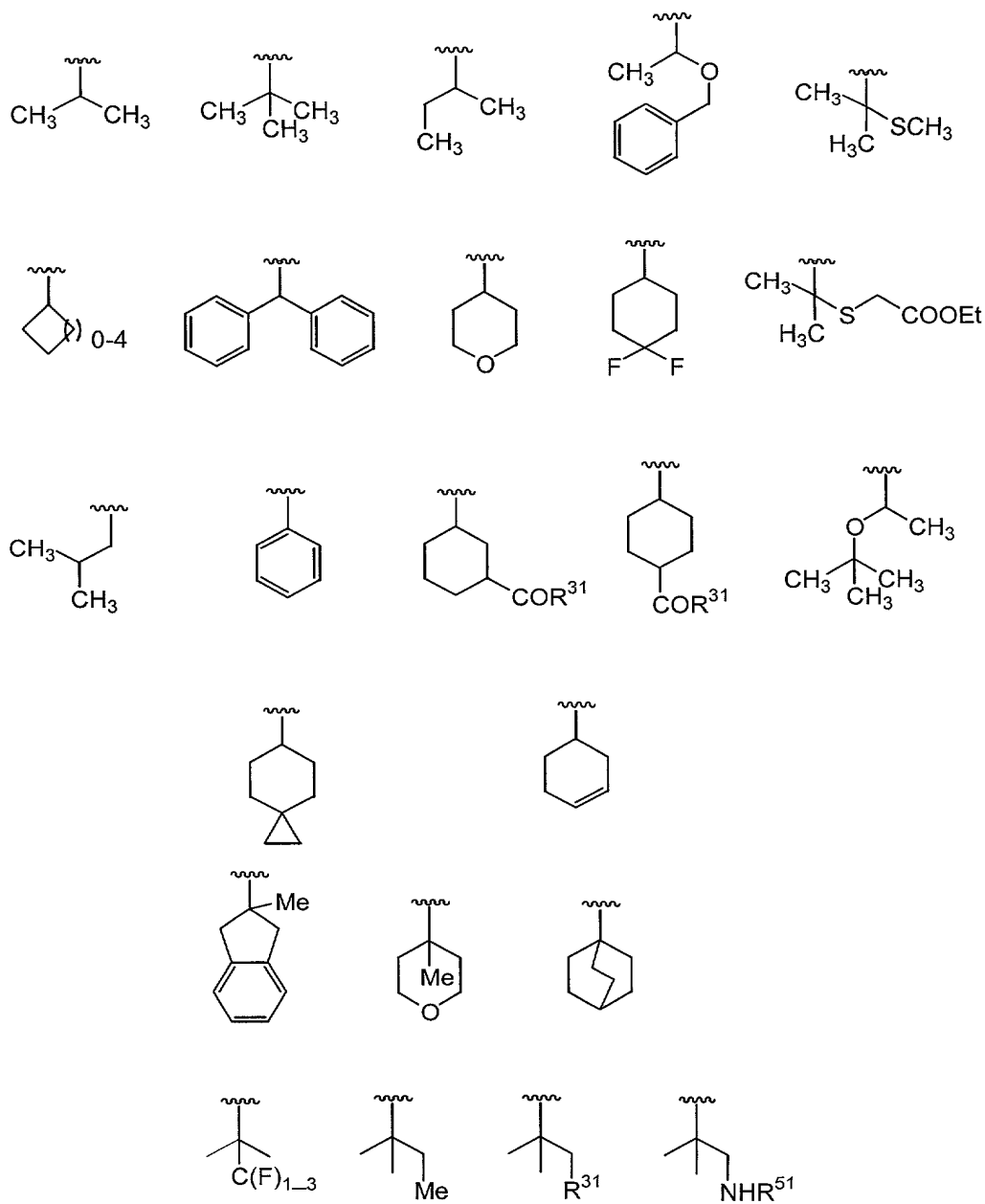
7. The compound of claim 2, wherein  $\text{R}^2$  is selected from the group consisting of the following moieties:



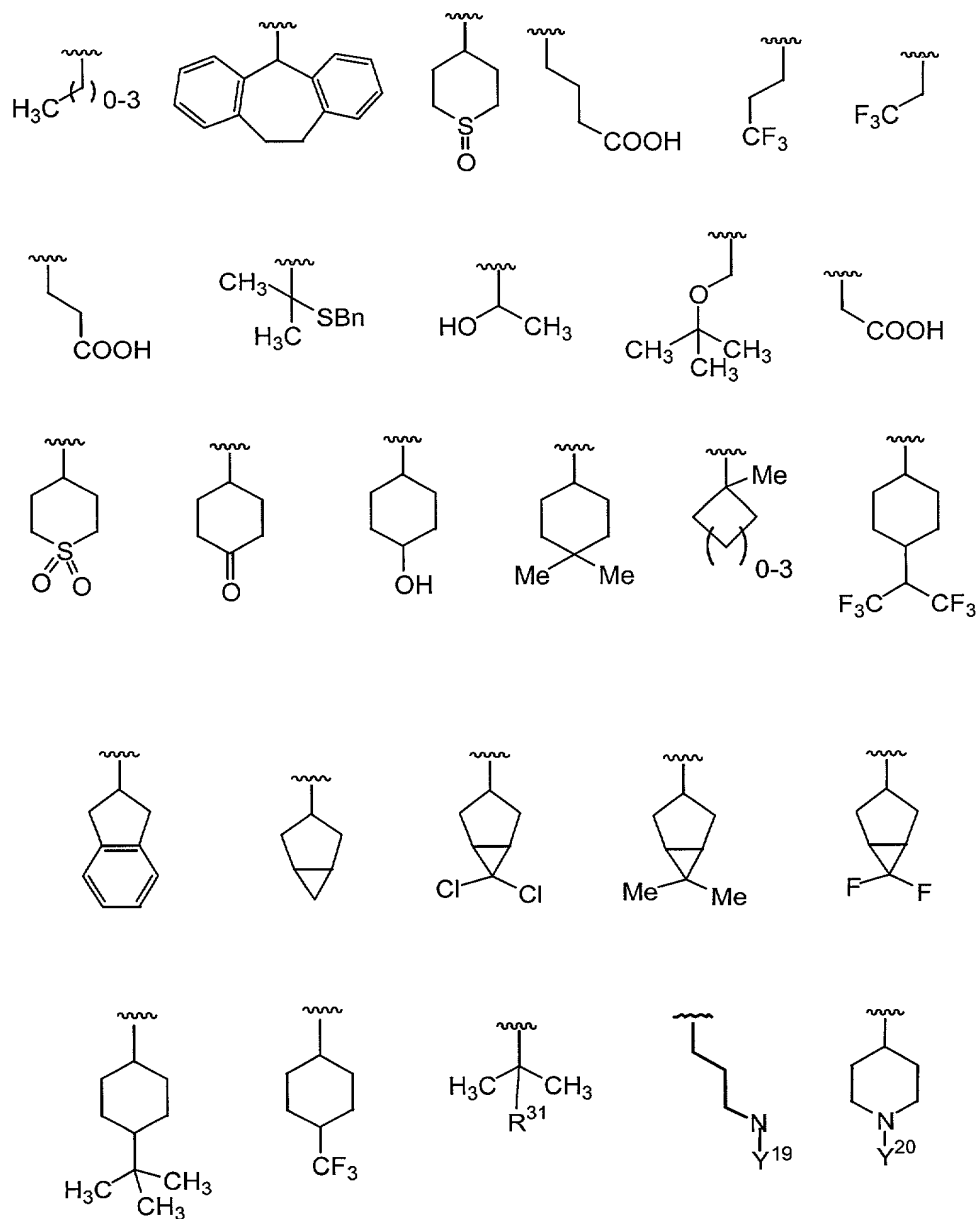


8. The compound of claim 7, wherein  $R^3$  is selected from the group consisting of:





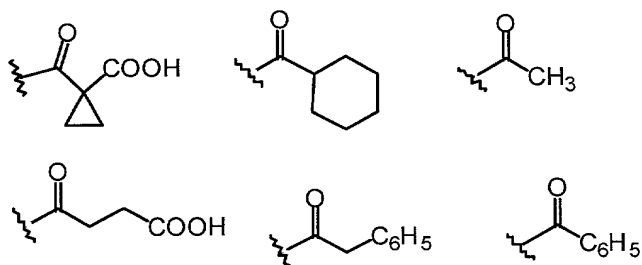
wherein R<sup>51</sup> = H, COCH<sub>3</sub>, COOtBu or CONHtBu



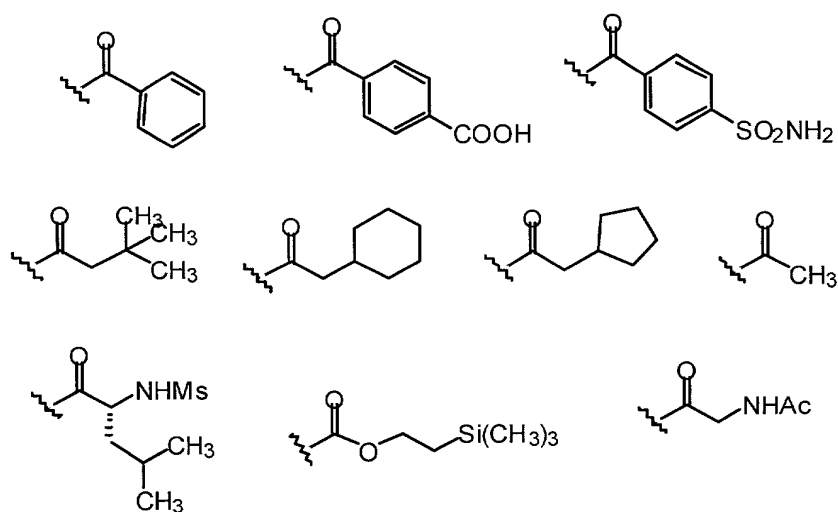
5

wherein  $R^{31}$  = OH or O-alkyl;

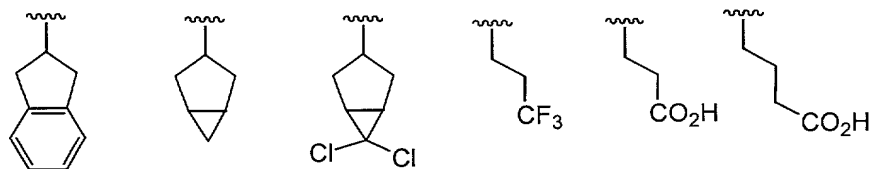
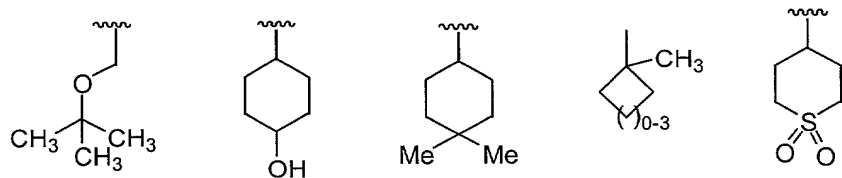
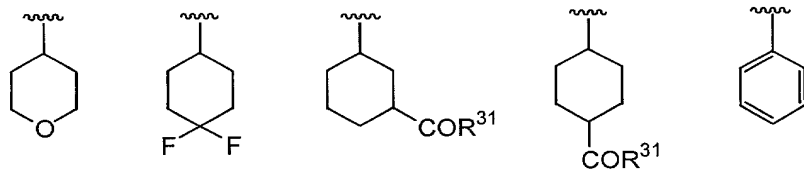
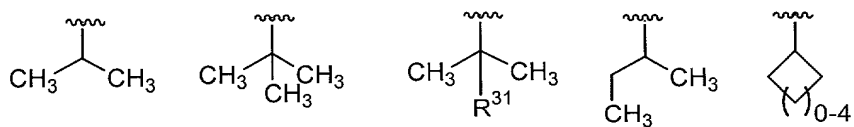
$Y^{19}$  is selected from the following moieties:



and  $Y^{20}$  is selected from the following moieties:

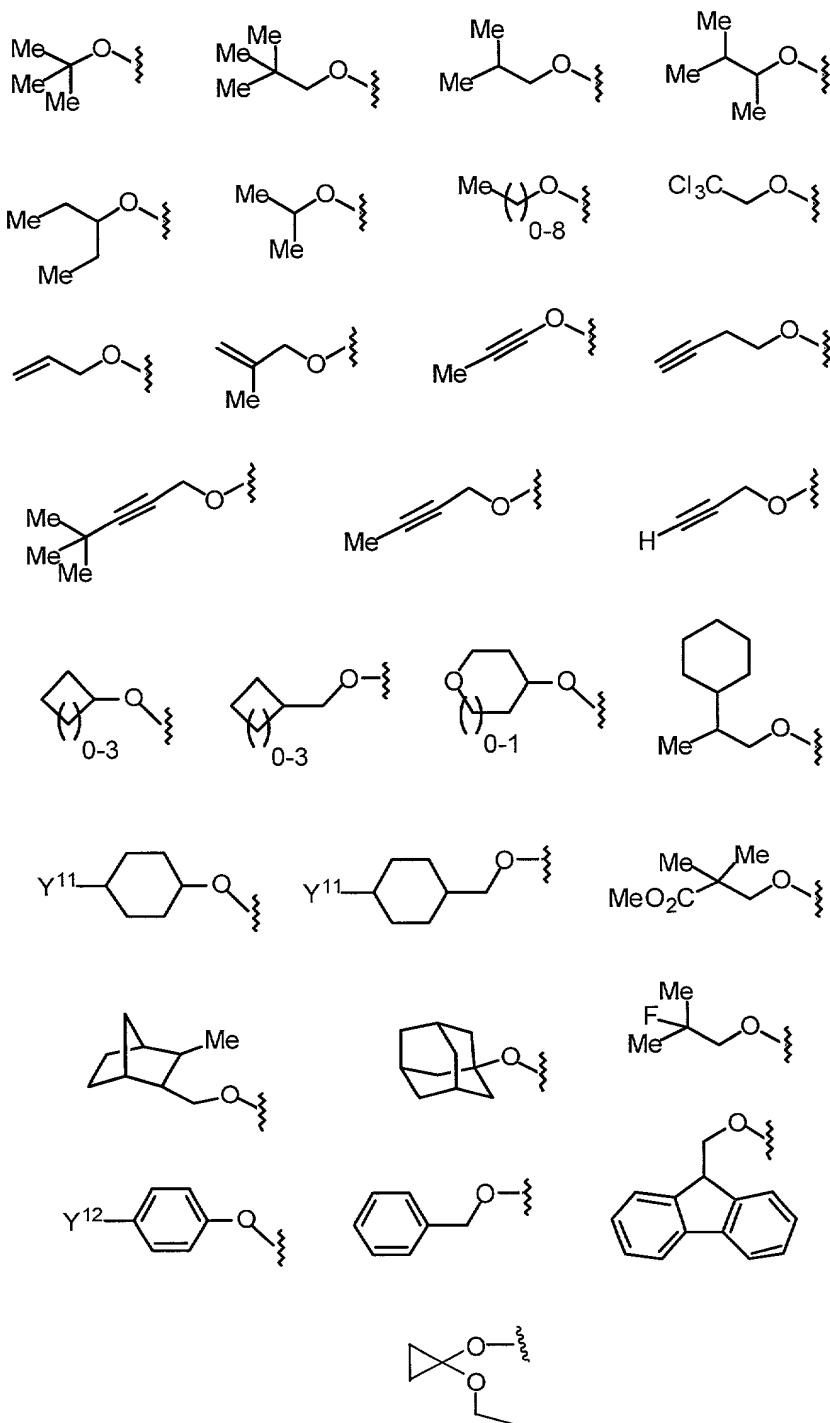


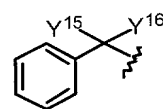
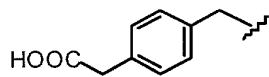
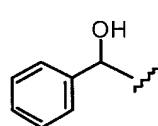
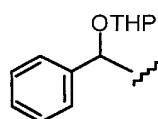
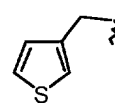
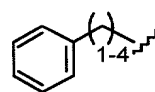
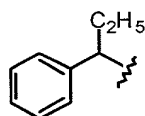
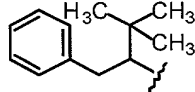
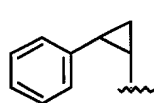
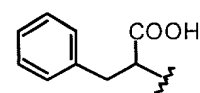
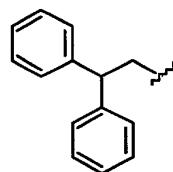
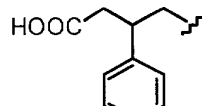
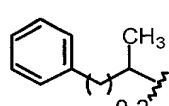
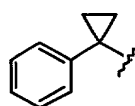
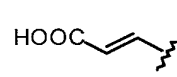
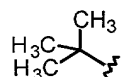
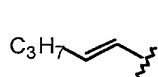
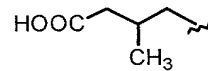
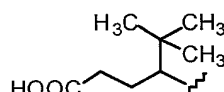
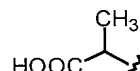
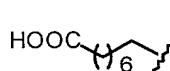
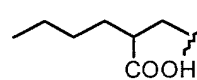
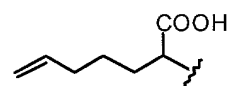
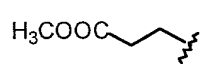
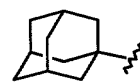
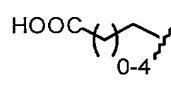
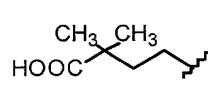
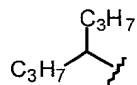
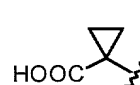
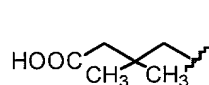
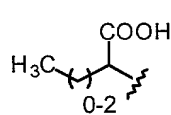
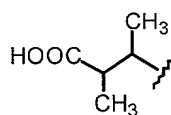
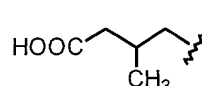
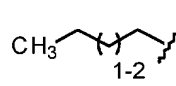
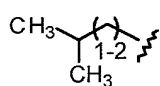
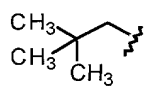
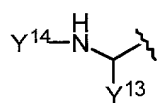
9. The compound of claim 8, wherein  $R^3$  is selected from the group consisting of the following moieties:

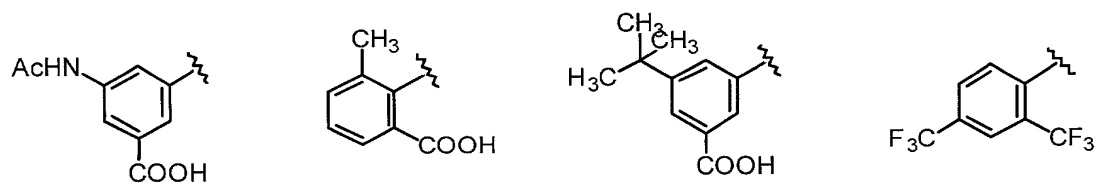
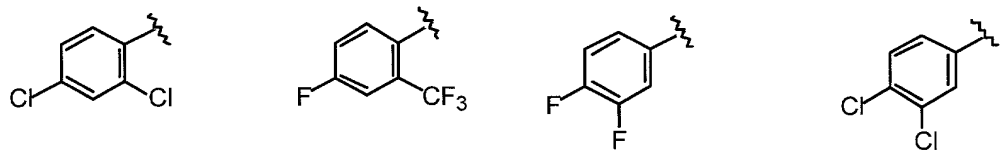
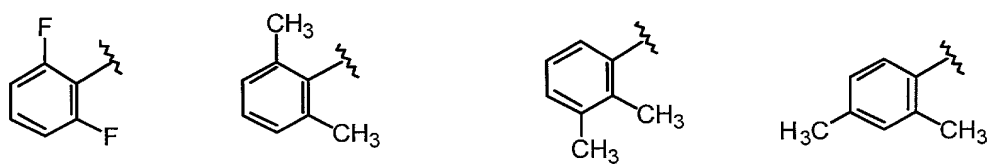
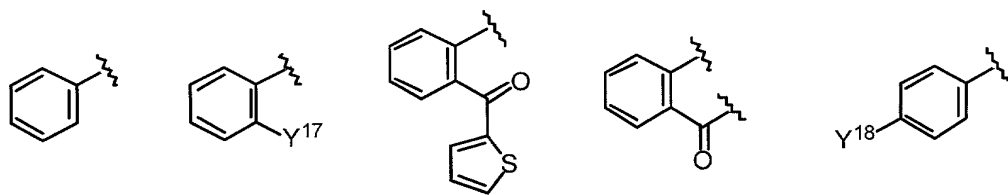
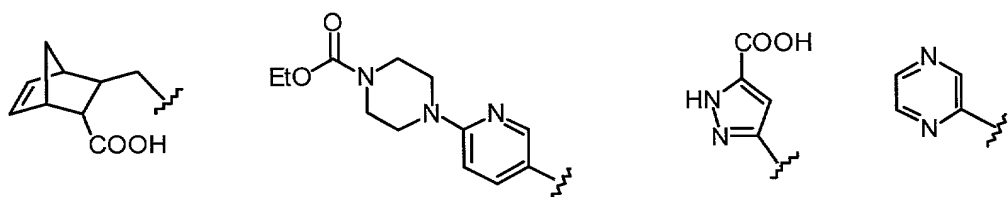
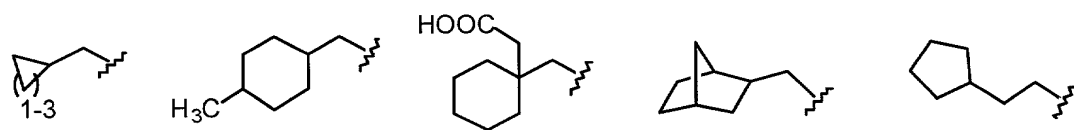
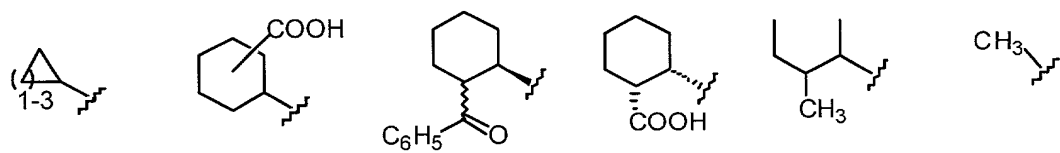


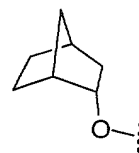
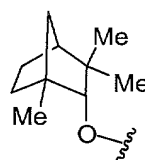
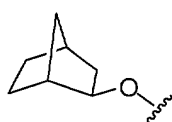
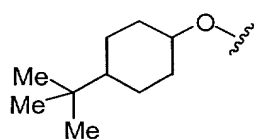
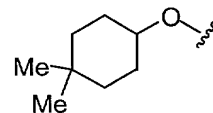
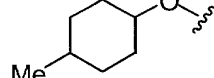
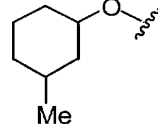
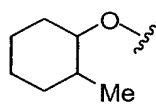
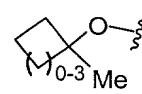
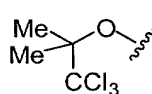
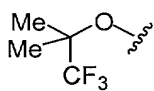
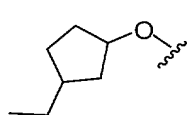
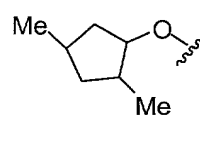
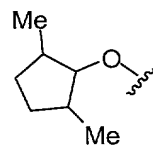
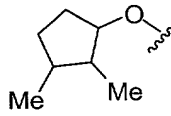
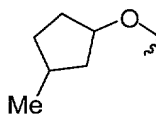
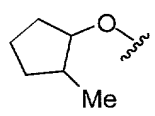
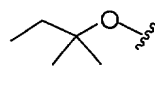
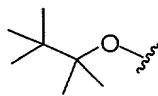
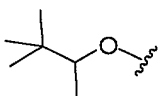
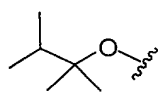
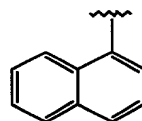
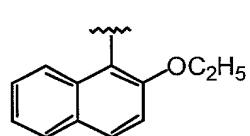
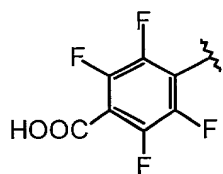
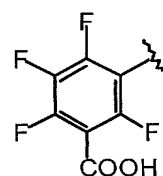
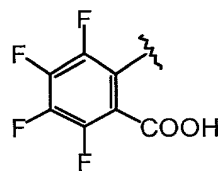
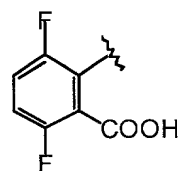
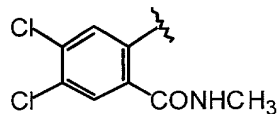
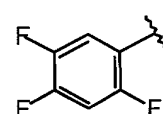
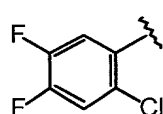
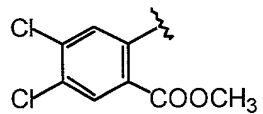
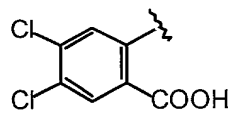
10. The compound of claim 9, wherein Z is N and R<sup>4</sup> is H.
11. The compound of claim 10, wherein W is C=O.

12. The compound of claim 11, wherein Y is selected from the following moieties:

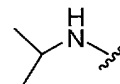
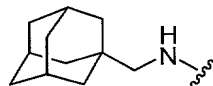
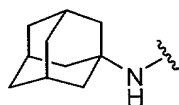
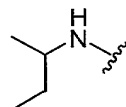
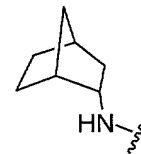
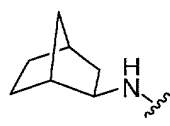
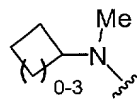
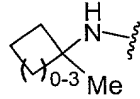
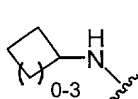
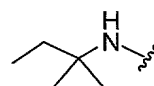
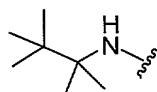
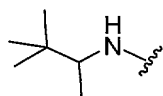
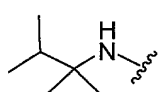
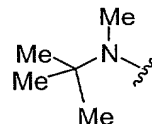
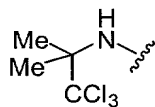
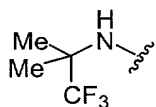
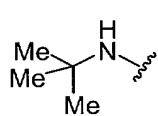
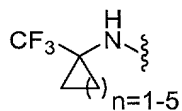










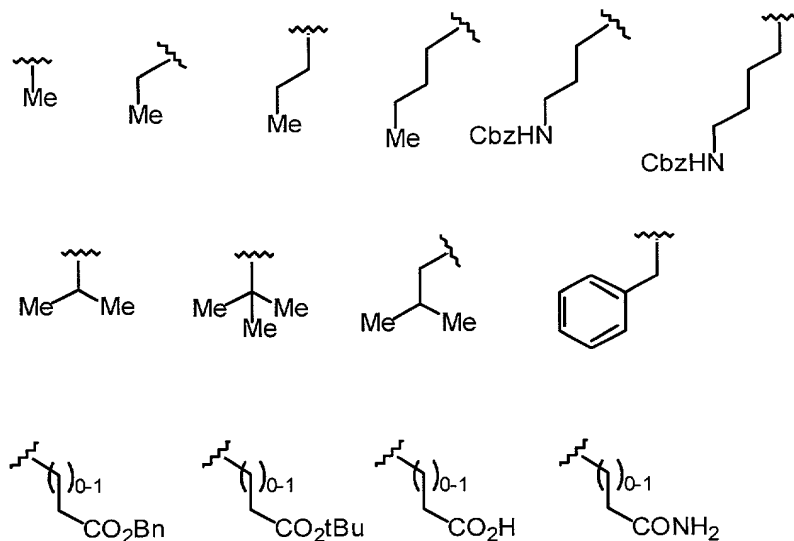


wherein:

- 5  $\text{Y}^{11}$  is selected from H,  $\text{COOH}$ ,  $\text{COOEt}$ ,  $\text{OMe}$ ,  $\text{Ph}$ ,  $\text{OPh}$ ,  $\text{NHMe}$ ,  $\text{NHAc}$ ,  $\text{NHPh}$ ,  $\text{CH}(\text{Me})_2$ , 1-triazolyl, 1-imidazolyl, and  $\text{NHCH}_2\text{COOH}$ ;

$\text{Y}^{12}$  is selected from H,  $\text{COOH}$ ,  $\text{COOMe}$ ,  $\text{OMe}$ , F, Cl, or Br;

$\text{Y}^{13}$  is selected from the following moieties:



$Y^{14}$  is selected from  $\text{MeSO}_2$ , Ac, Boc, iBoc, Cbz, or Alloc;

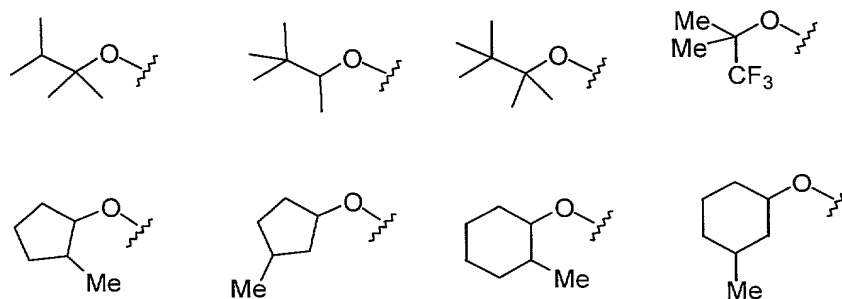
$Y^{15}$  and  $Y^{16}$  are independently selected from alkyl, aryl, heteroalkyl, and

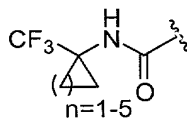
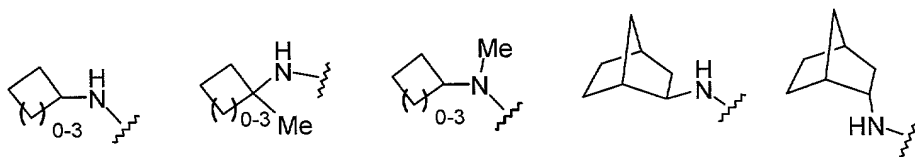
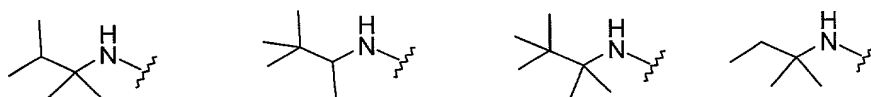
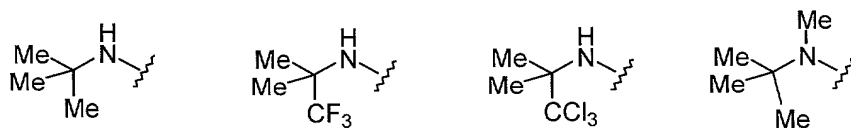
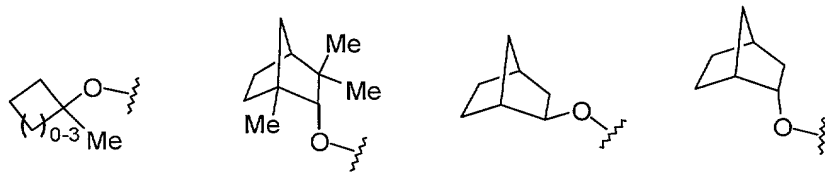
5 heteroaryl;

$Y^{17}$  is  $\text{CF}_3$ ,  $\text{NO}_2$ ,  $\text{CONH}_2$ , OH,  $\text{COOCH}_3$ ,  $\text{OCH}_3$ ,  $\text{OC}_6\text{H}_5$ ,  $\text{C}_6\text{H}_5$ ,  $\text{COC}_6\text{H}_5$ ,  $\text{NH}_2$ , or  $\text{COOH}$ ; and

$Y^{18}$  is  $\text{COOCH}_3$ ,  $\text{NO}_2$ ,  $\text{N}(\text{CH}_3)_2$ , F,  $\text{OCH}_3$ ,  $\text{CH}_2\text{COOH}$ ,  $\text{COOH}$ ,  $\text{SO}_2\text{NH}_2$ , or  $\text{NHCOCH}_3$ .

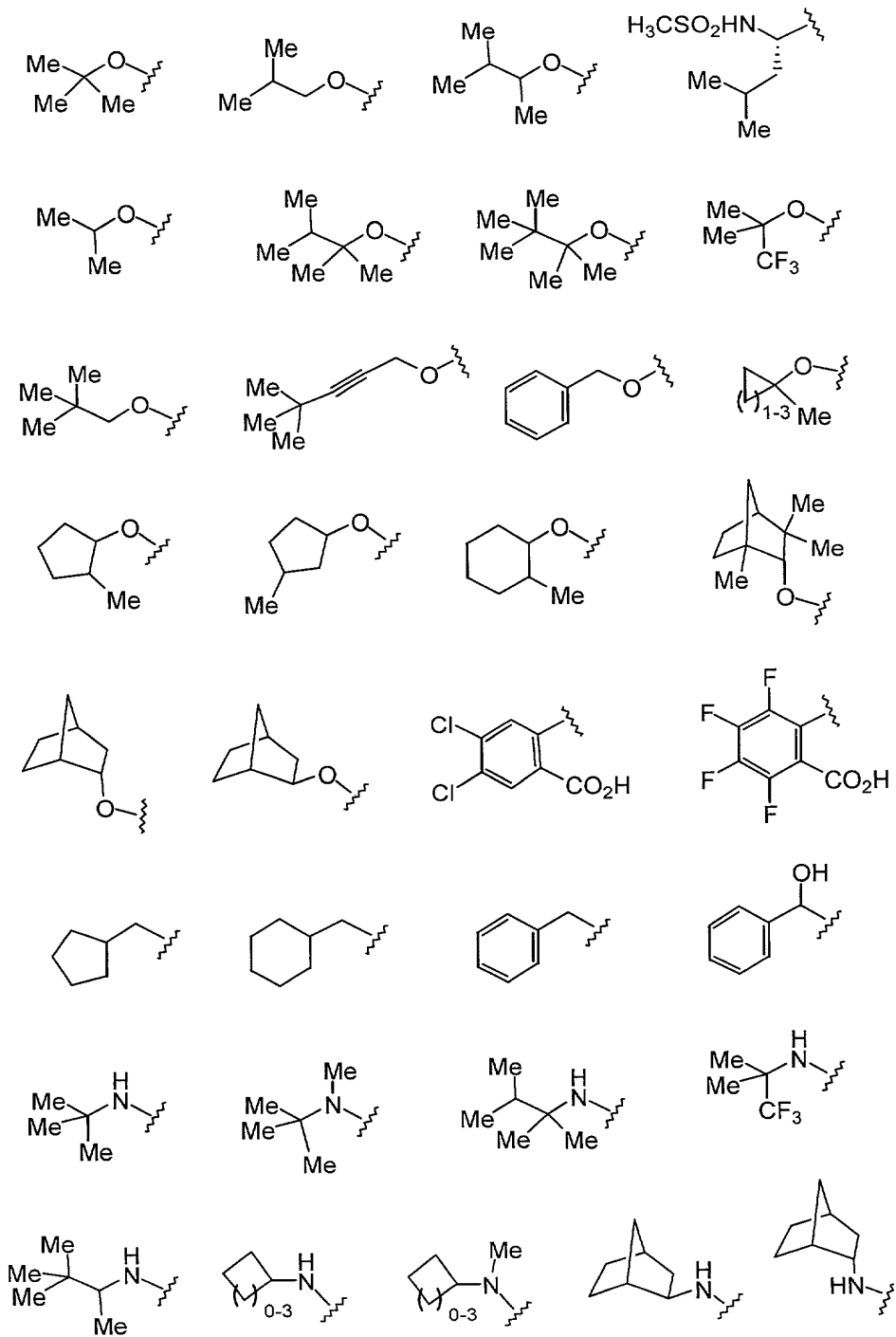
10 13. The compound of claim 12, wherein Y is selected from the group consisting of:



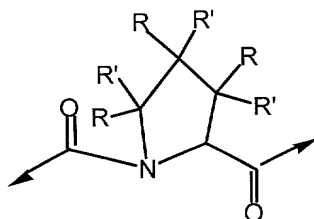
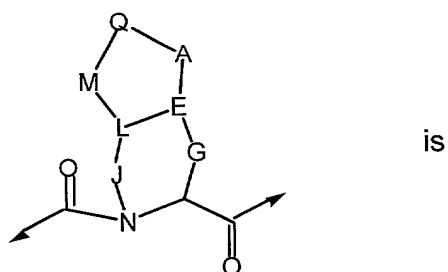



$$Y^{18} = F, COOH,$$

14. The compound of claim 13, wherein Y is selected from the group consisting of:

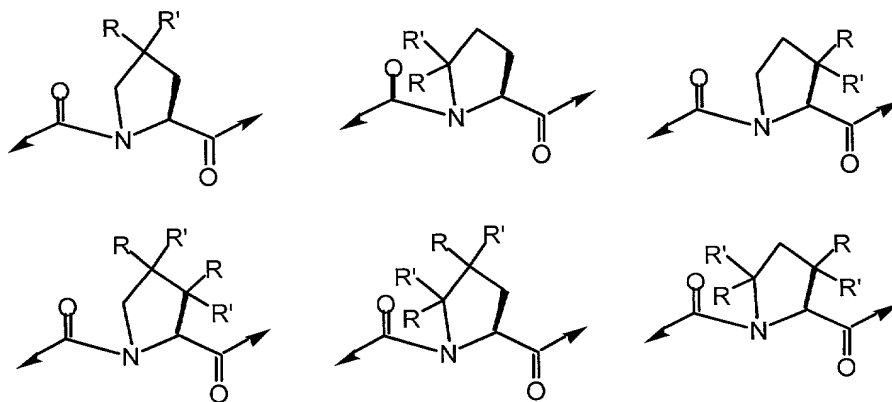


15. The compound of claim 14, wherein L and M are absent, and J is directly linked to E.
16. The compound of claim 14, wherein L, J and M are absent and E is directly linked to N.
- 5 17. The compound of claim 14, wherein G and M are absent.
18. The compound of claim 14, wherein the moiety:

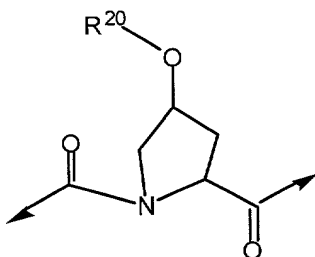


a

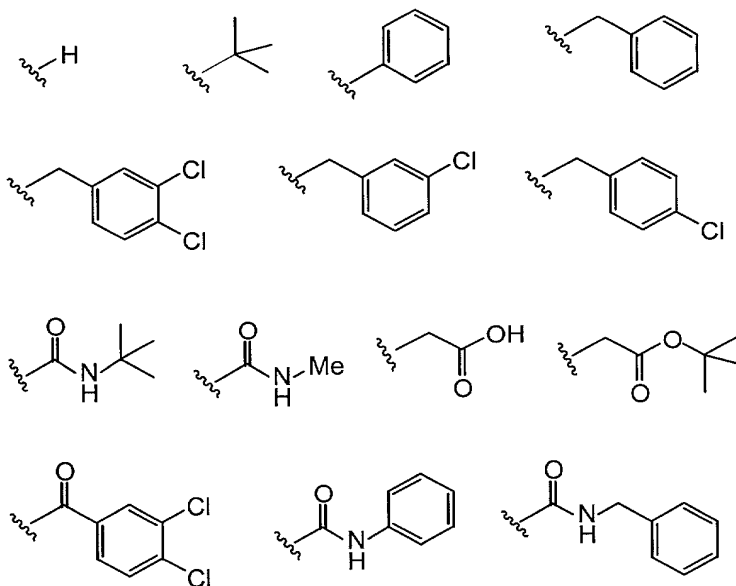
- 10 19. The compound of claim 18, wherein structure a is selected from the following structures:



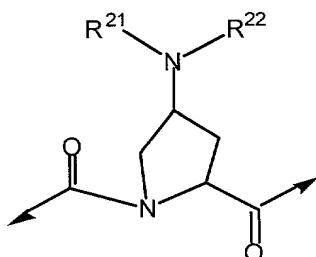
20. The compound of claim 18, wherein structure a is:



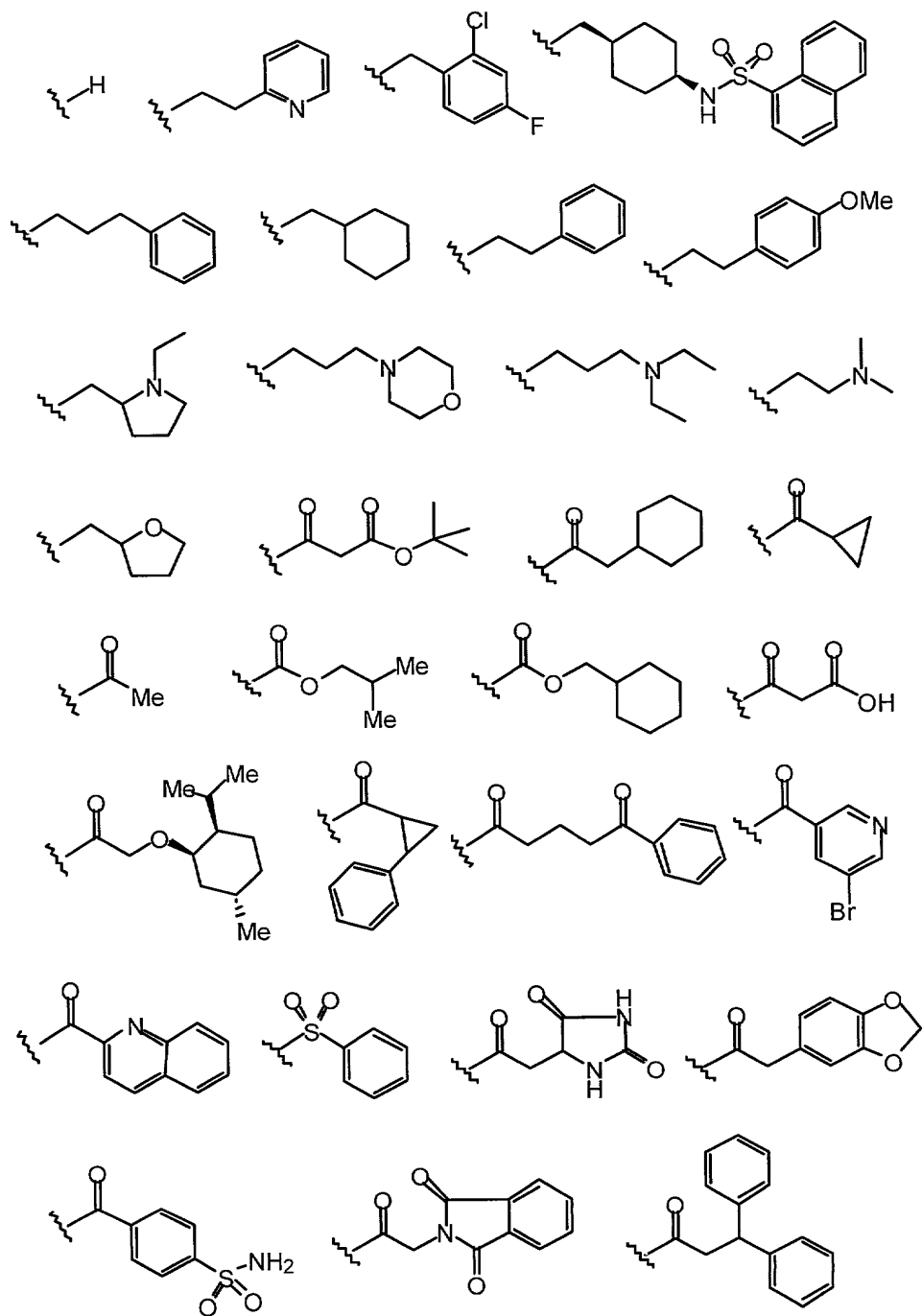
5 wherein  $R^{20}$  is selected from the following structures:



21. The compound of claim 18, wherein structure a is:



10 wherein  $R^{21}$  and  $R^{22}$  may be the same or different and are independently selected from the following structures:

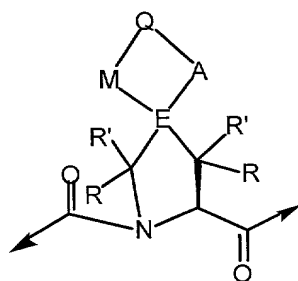
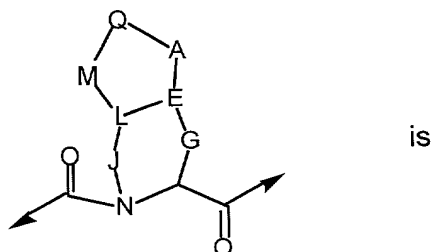


22. The compound of claim 18, wherein structure a is selected from the following structures:





23. The compound of claim 14, wherein:

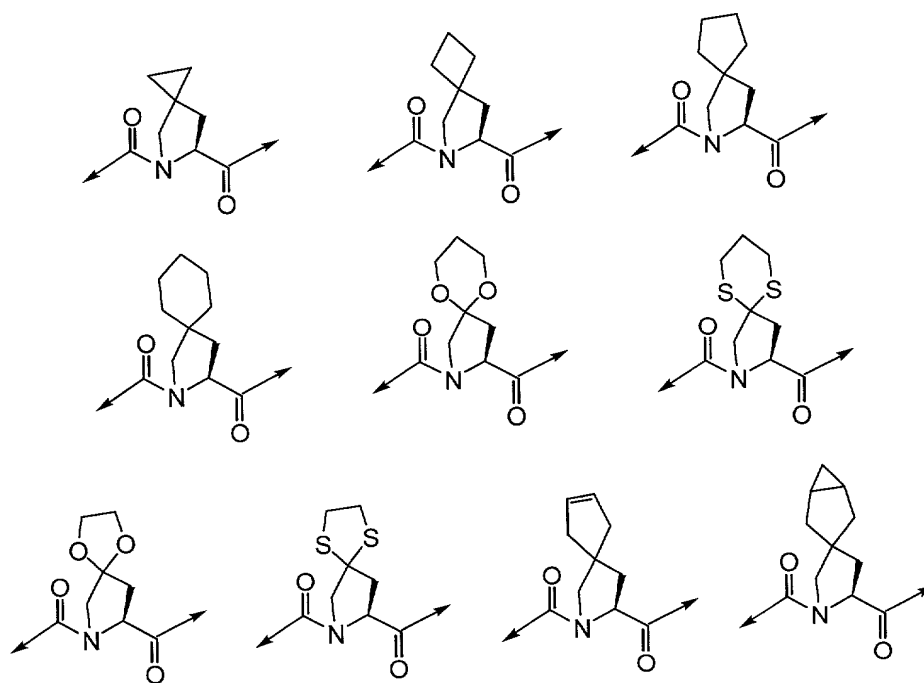


b

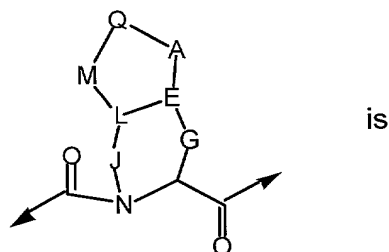
wherein Q may be present or absent, and if Q is absent, M is directly linked to A.

24. The compound of claim 23, wherein structure b is selected from the

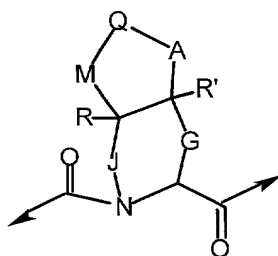
5 following structures:



25. The compound of claim 14, wherein:

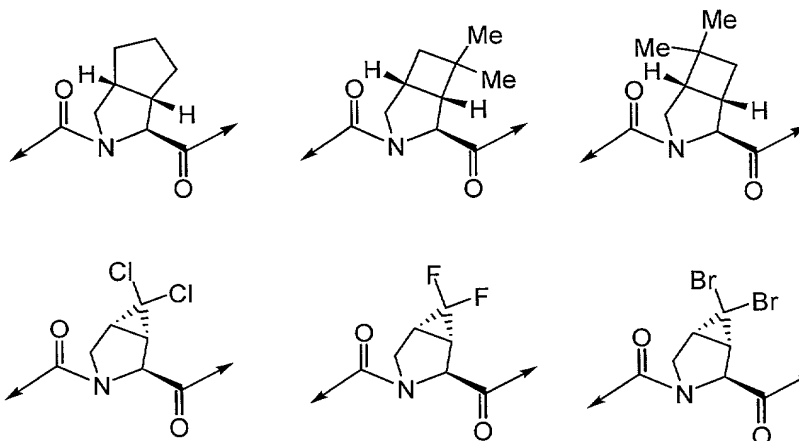


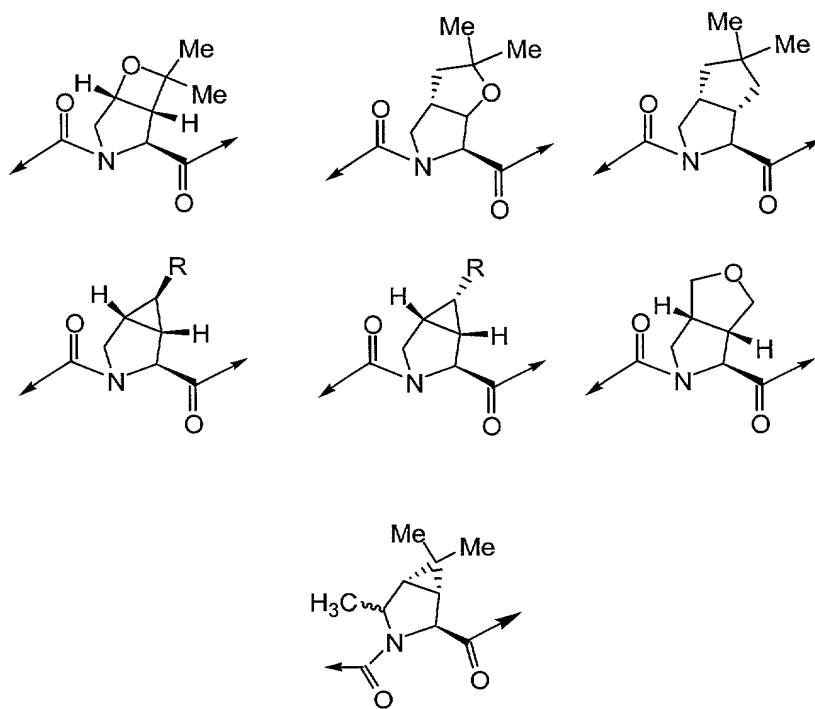
is

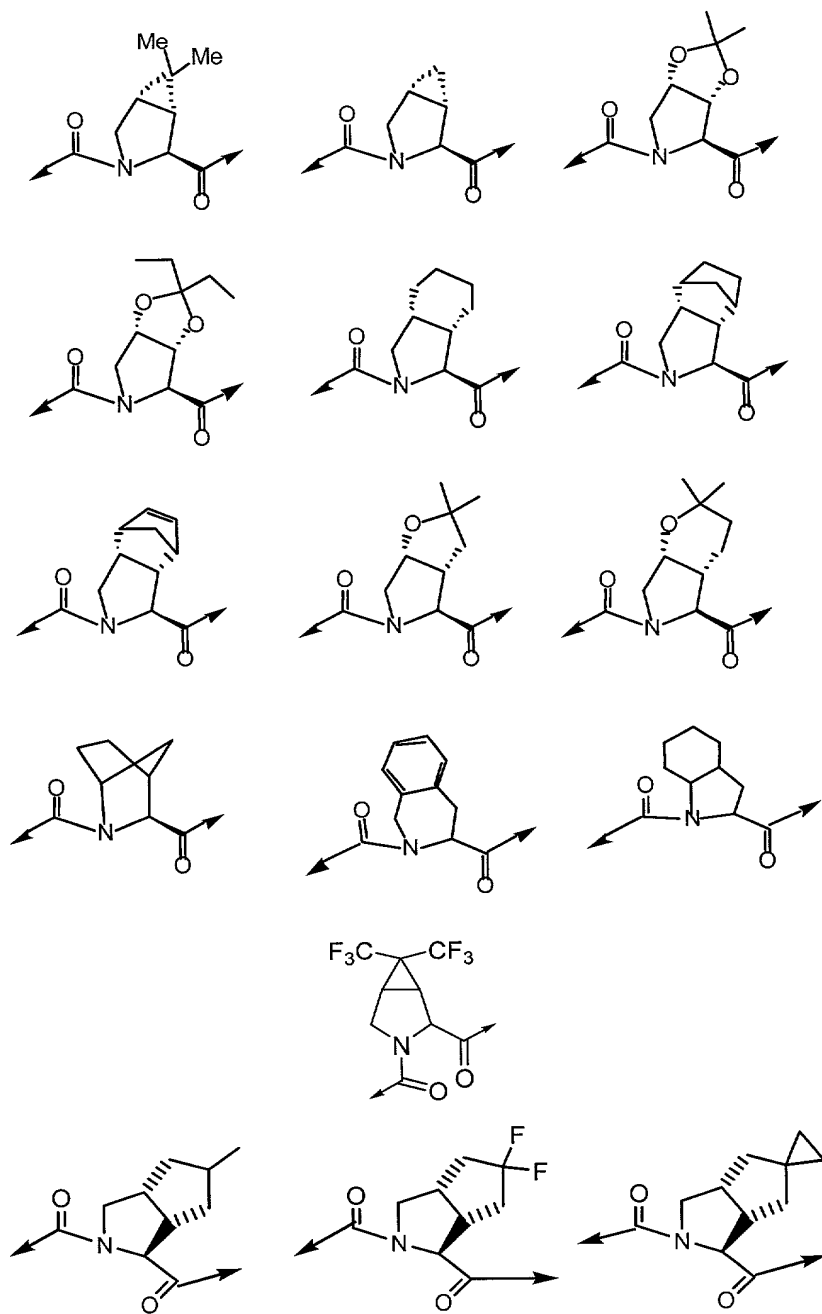


c

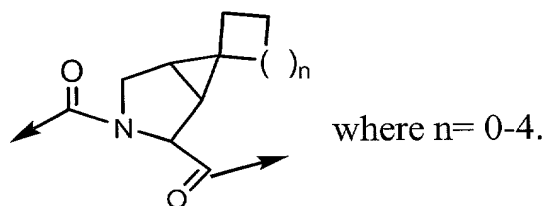
- wherein G and J are independently selected from the group consisting of  $(CH_2)_p$ ,  $(CHR)_p$ ,  $(CHR-CHR')_p$ , and  $(CRR')_p$ ; A and M are independently selected from the group consisting of O, S,  $SO_2$ , NR,  $(CH_2)_p$ ,  $(CHR)_p$ ,  $(CHR-CHR')_p$ , and  $(CRR')_p$ ; and Q is  $CH_2$ , CHR, CRR', NH, NR, O, S,  $SO_2$ , NR,  $(CH_2)_p$ ,  $(CHR)_p$ , and  $(CRR')_p$ .
26. The compound of claim 25, wherein structure c is selected from the following structures:



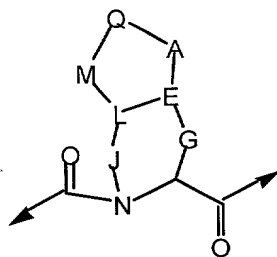




and

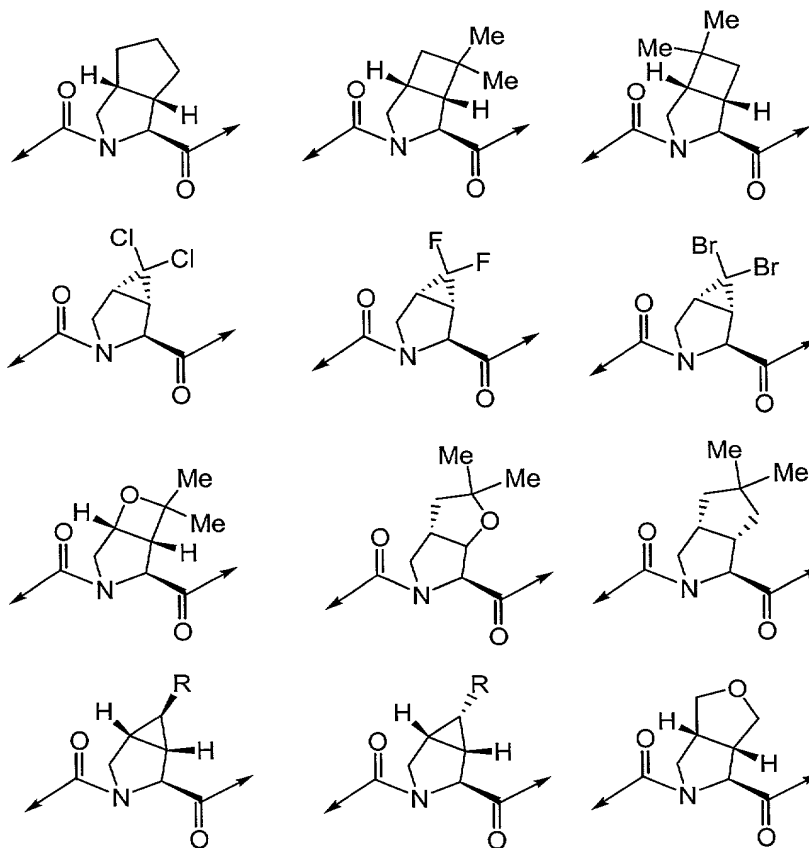


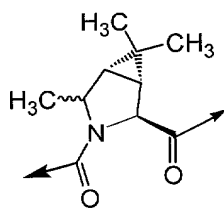
27. The compound of claim 14, wherein:

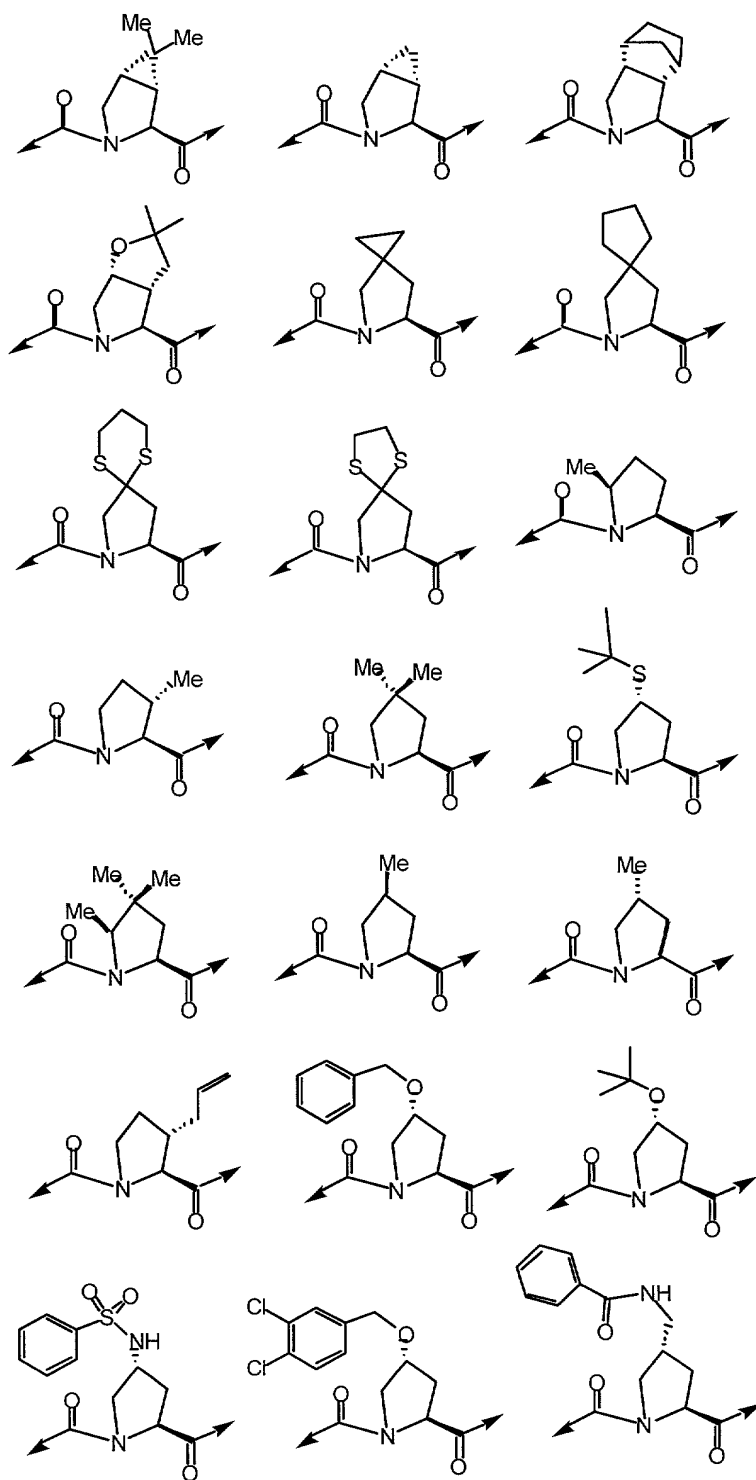


is selected from the following structures:

5

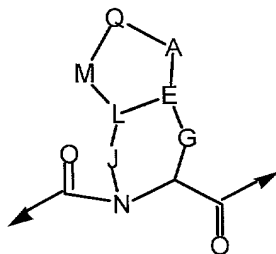




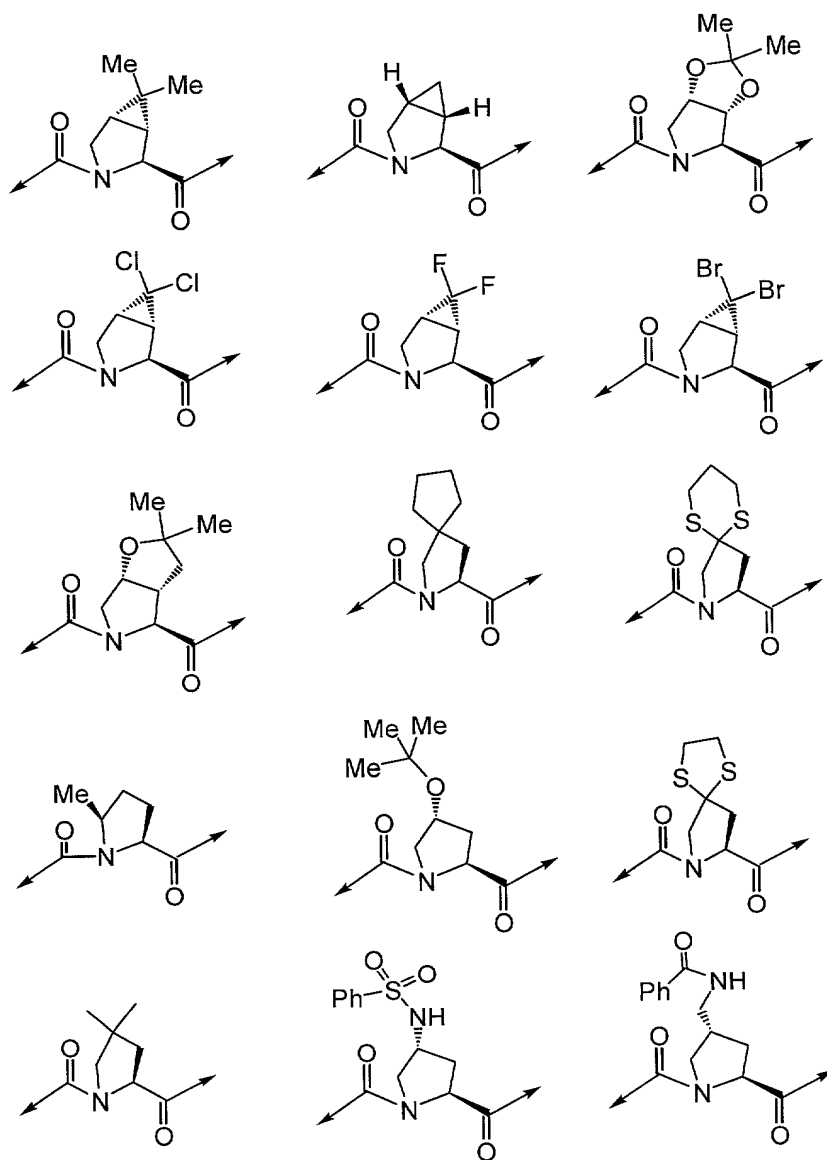


28. The compound of claim 27, wherein:

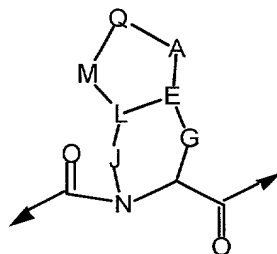




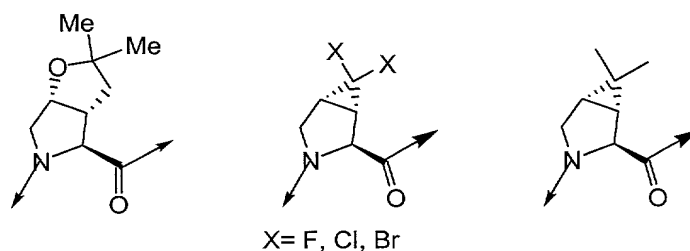
is selected from the following structures:



28. The compound of claim 27, wherein:



is selected from the following structures:



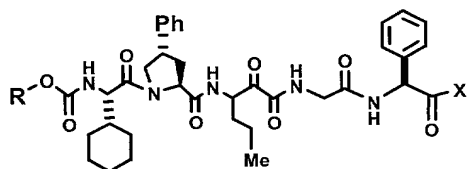
30. A pharmaceutical composition comprising as an active ingredient a compound of claim 1.
31. The pharmaceutical composition of claim 30 for use in treating disorders associated with HCV.
32. The pharmaceutical composition of claim 30 additionally comprising a pharmaceutically acceptable carrier.
33. The pharmaceutical composition of claim 32, additionally containing an antiviral agent.
34. The pharmaceutical composition of claim 33, still additionally containing an interferon.
35. The pharmaceutical composition of claim 34, wherein said antiviral agent is ribavirin and said interferon is  $\alpha$ -interferon or pegylated interferon.
36. A method of treating disorders associated with the HCV, said method comprising administering to a patient in need of such treatment a pharmaceutical composition which comprises therapeutically effective amounts of a compound of claim 1.
37. The method of claim 36, wherein said administration is oral or subcutaneous.

38. The use of a compound of claim 1 for the manufacture of a medicament to treat disorders associated with the HCV.

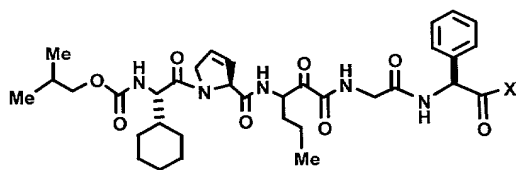
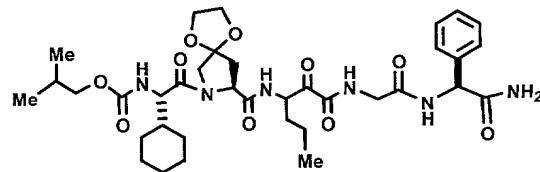
39. A method of preparing a pharmaceutical composition for treating the disorders associated with the HCV, said method comprising bringing into intimate  
5 contact a compound of claim 1 and a pharmaceutically acceptable carrier.

40. A compound exhibiting HCV protease inhibitory activity, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said compound, and pharmaceutically acceptable salts or solvates of said compound, or of said prodrug, said compound being selected from the compounds of  
10 structures listed below:

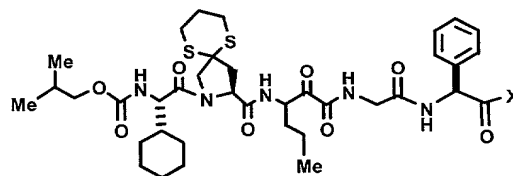
Chemical structure of compound 1



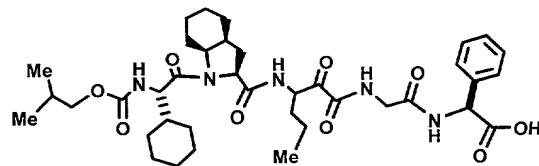
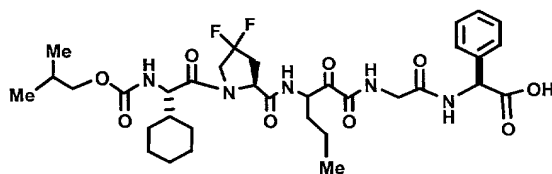
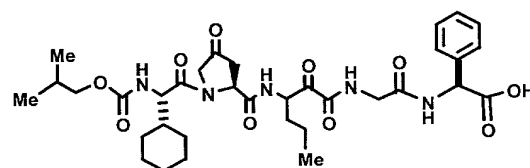
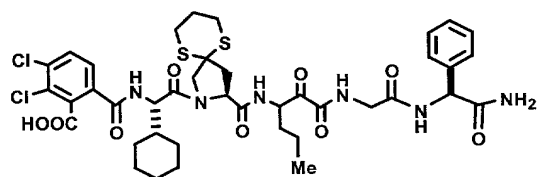
(R = t-butyl, X = NH<sub>2</sub>)  
 (R = Isobutyl, X = NH<sub>2</sub>)  
 (R = t-butyl, X = OH)  
 (R = Trichloroethyl, X = OH)

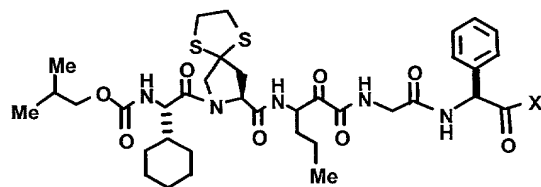
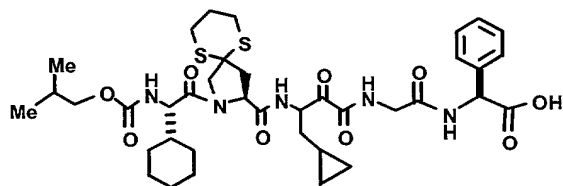


(X = O<sup>t</sup>Bu)  
 (X = OH)

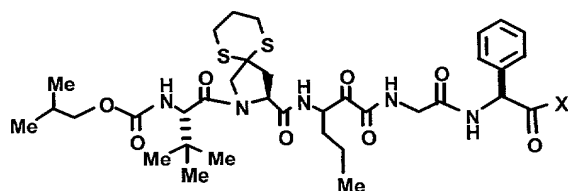
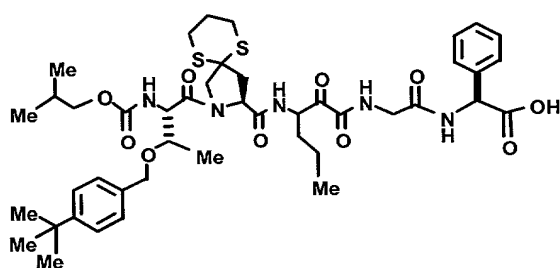
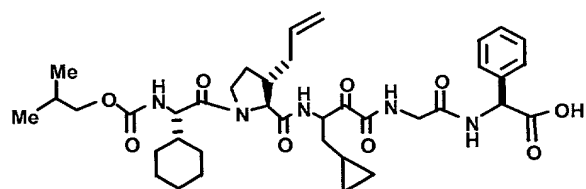
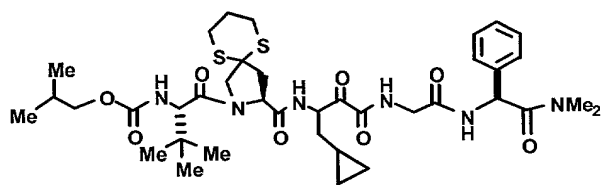


(X = OH)  
 (X = O<sup>t</sup>Bu)  
 (X = NH<sub>2</sub>)  
 (X = NHMe)  
 (X = NMe<sub>2</sub>)

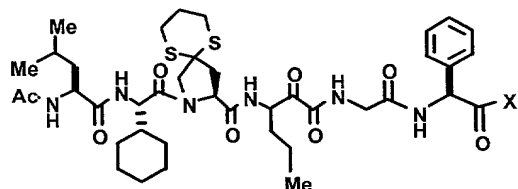




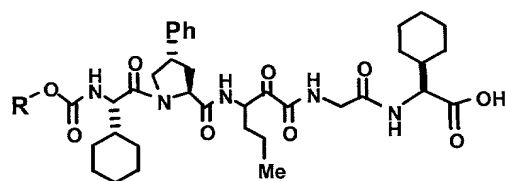
(X = NH<sub>2</sub>)  
 (X = NMe<sub>2</sub>)  
 (X = NHMe)  
 (X = OH)



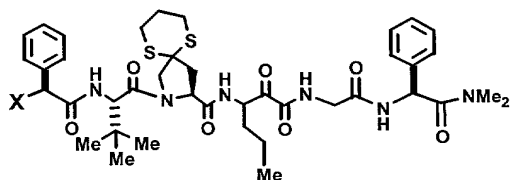
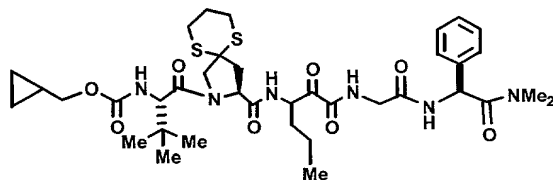
(X = O<sup>t</sup>Bu)  
 (X = OH)  
 (X = NH<sub>2</sub>)  
 (X = NMe<sub>2</sub>)



(X = O<sup>t</sup>Bu)  
 (X = OH)  
 (X = NH<sub>2</sub>)  
 (X = NMe<sub>2</sub>)  
 (X = NMeOMe)

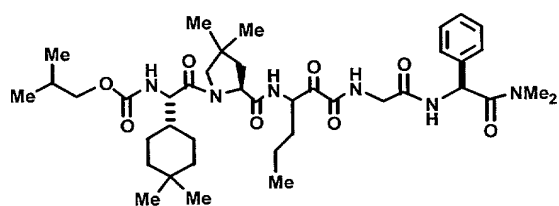
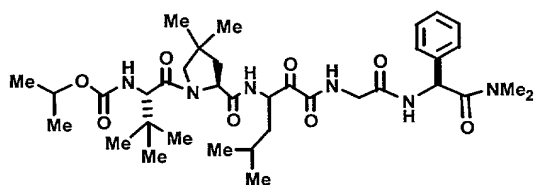
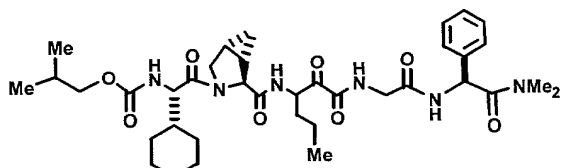
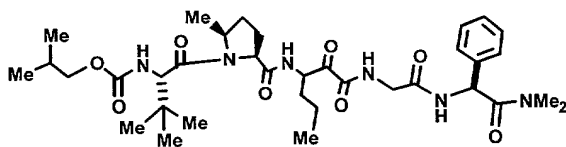
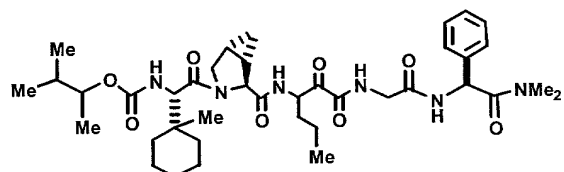
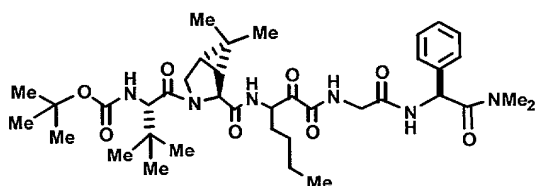
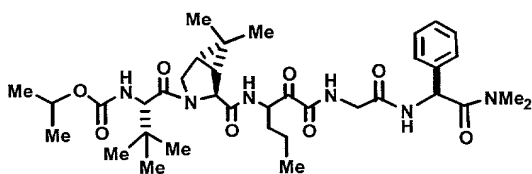
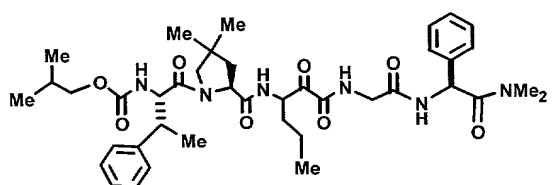


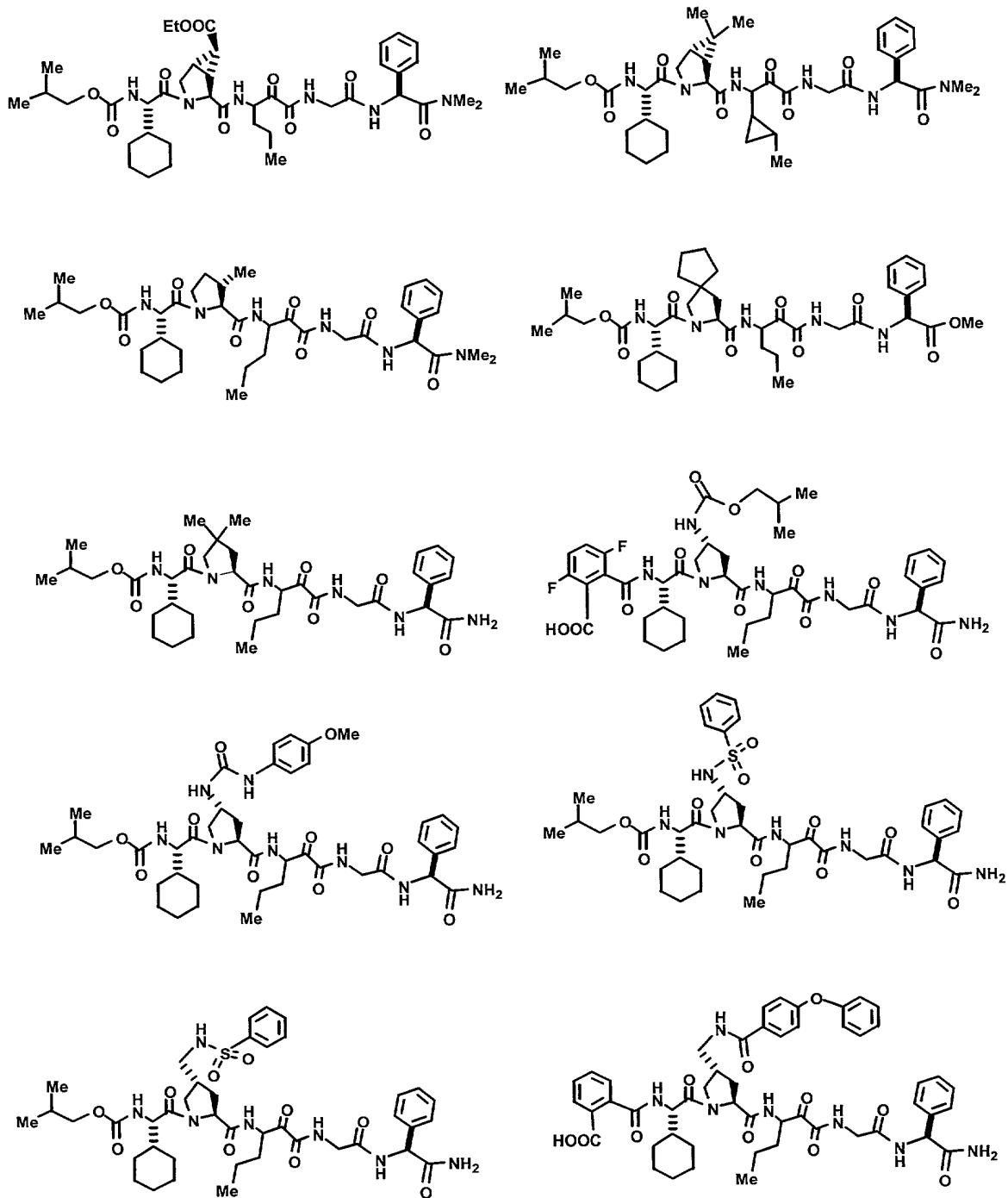
(R = t-butyl)  
 (R = Isobutyl)

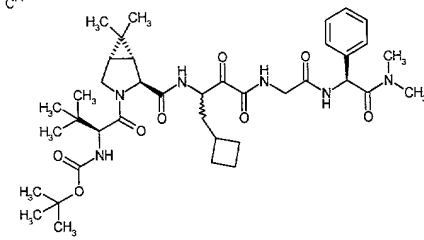
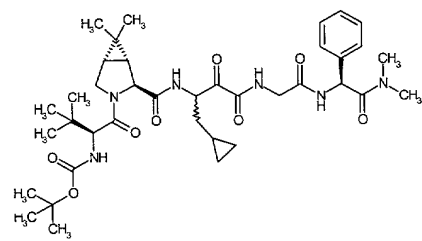
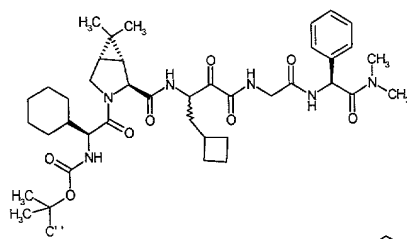
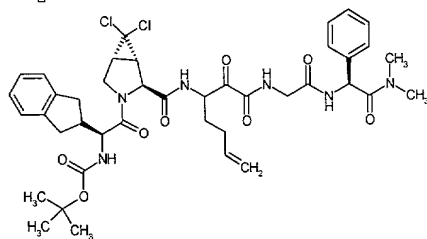
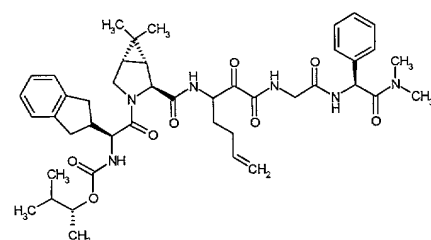
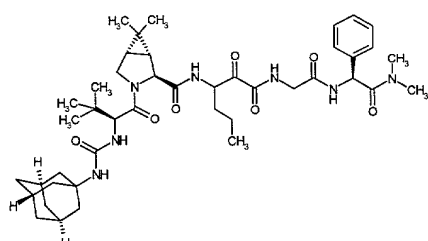
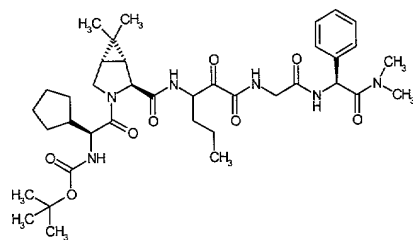
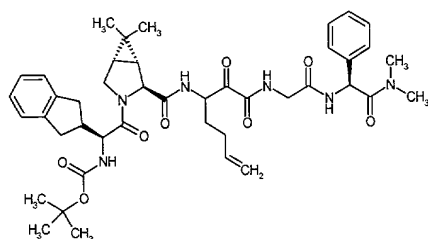
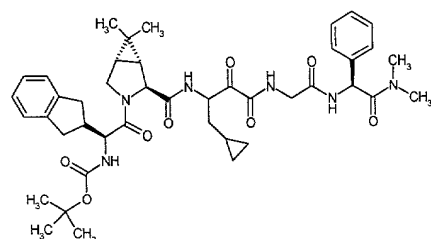
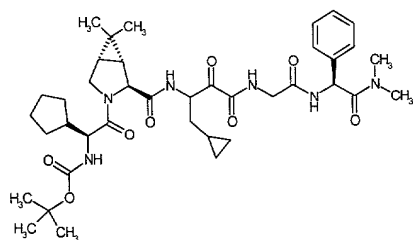
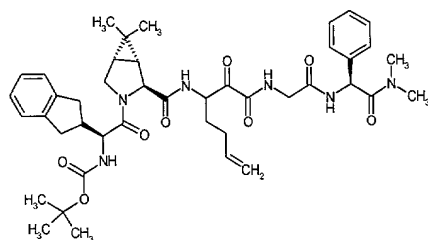
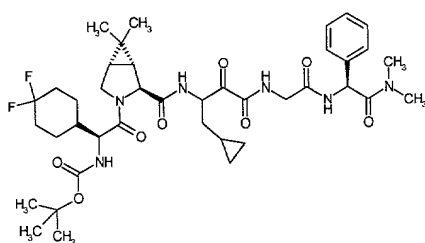


(X = Me, Y = CH<sub>2</sub>Me)

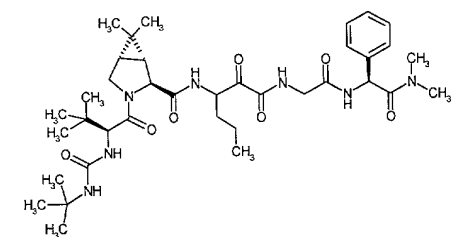
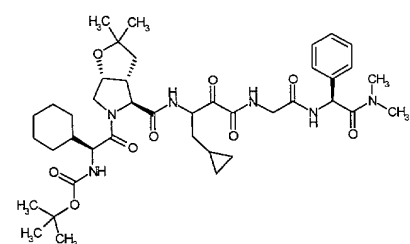
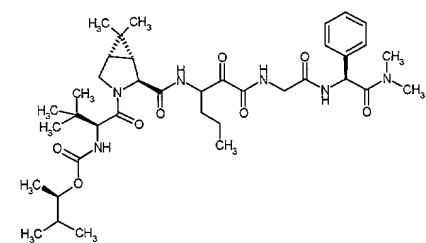
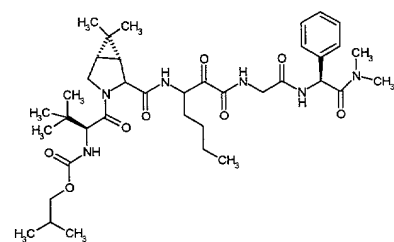
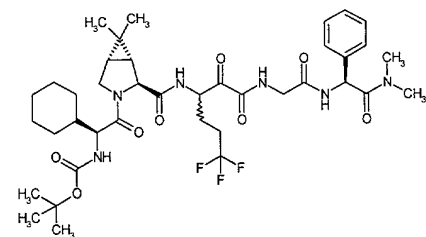
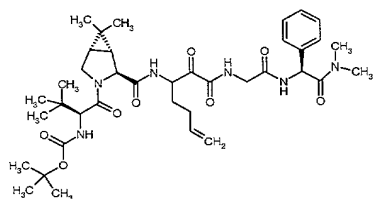
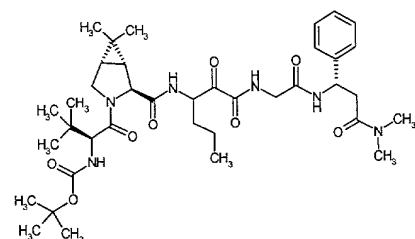
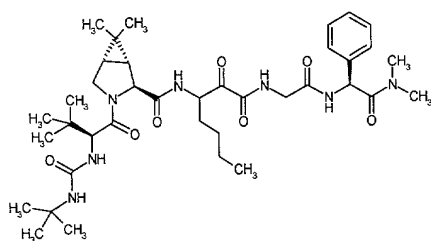
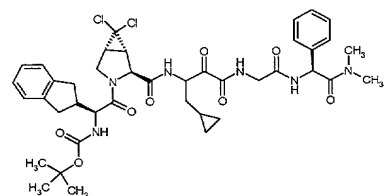
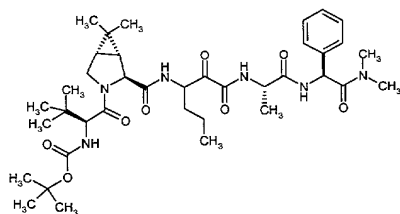
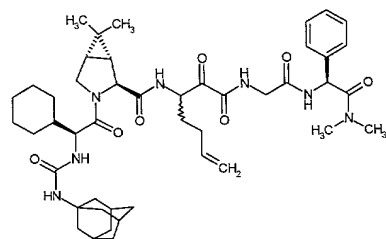
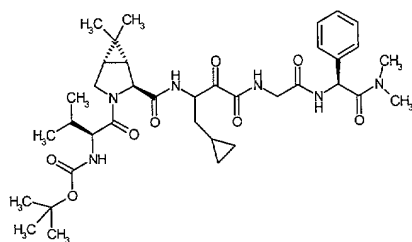
(X = OAc, Y = Me)

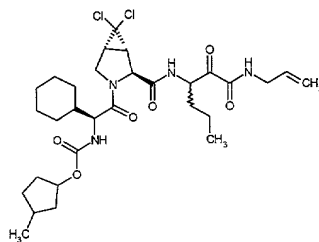
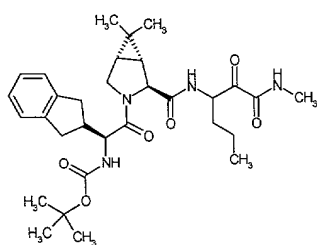
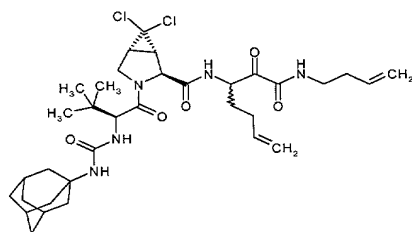
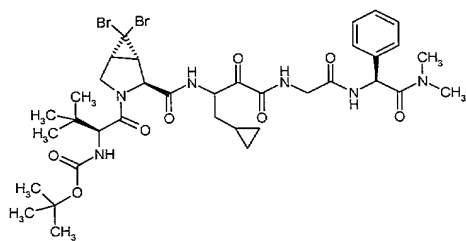
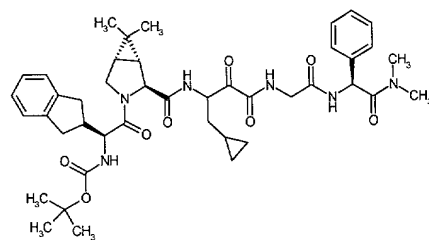
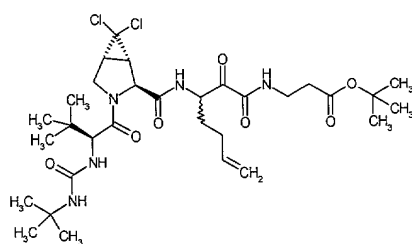
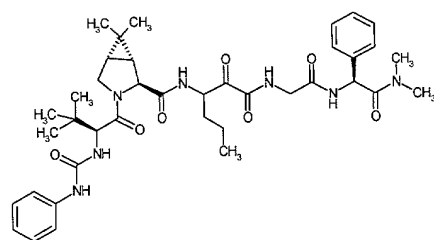
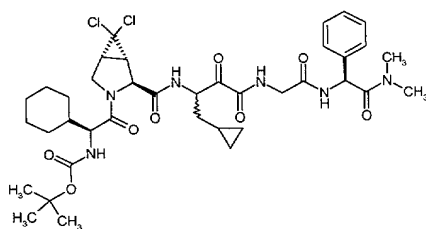
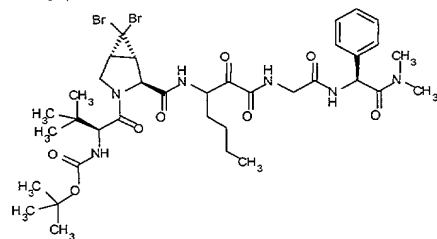
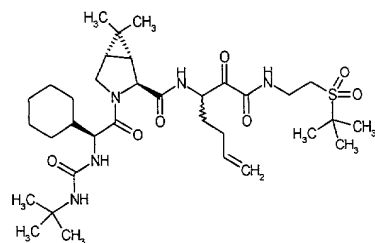
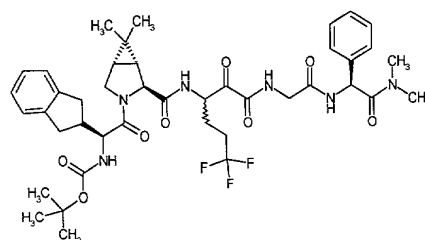
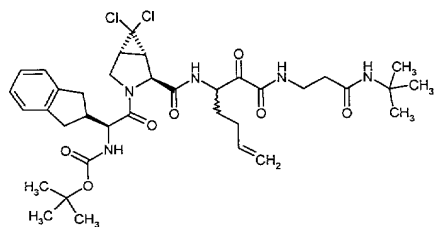


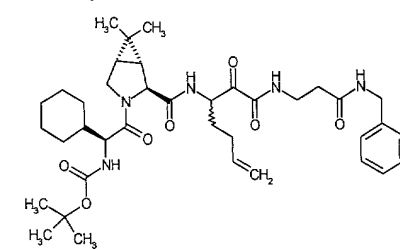
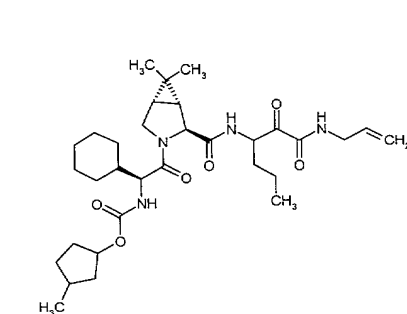


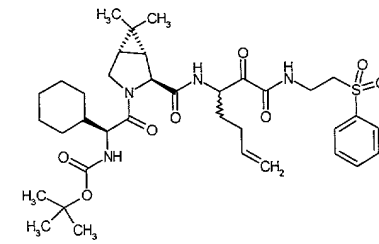
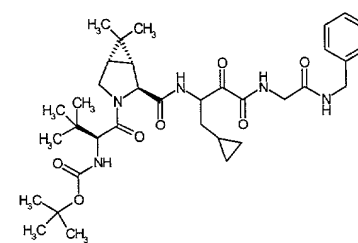
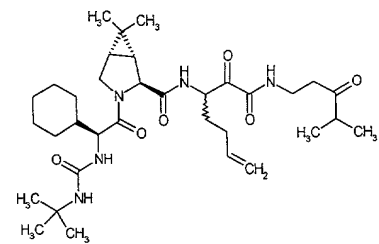
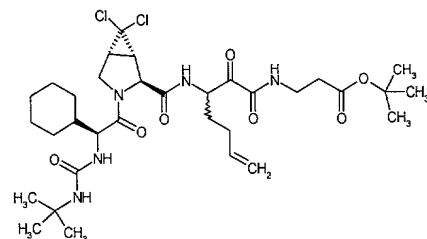
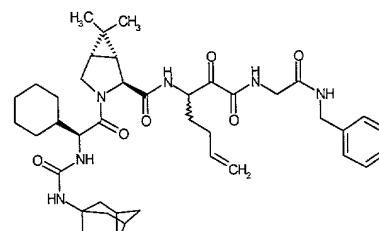
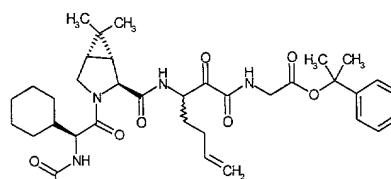
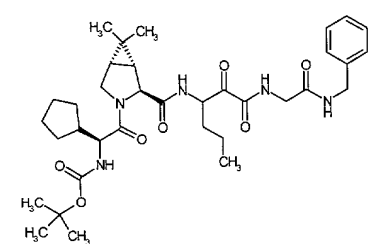
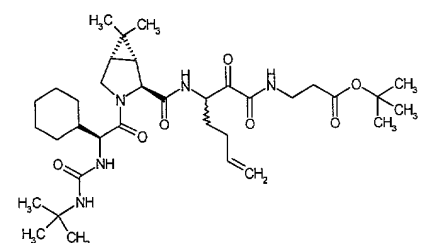
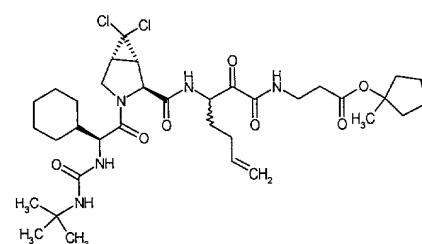
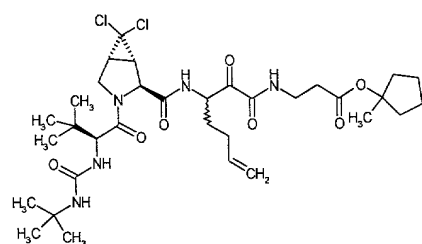
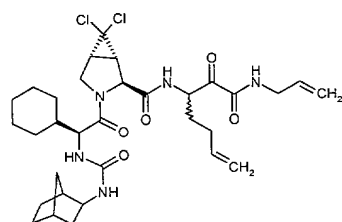
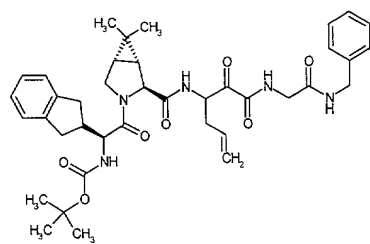


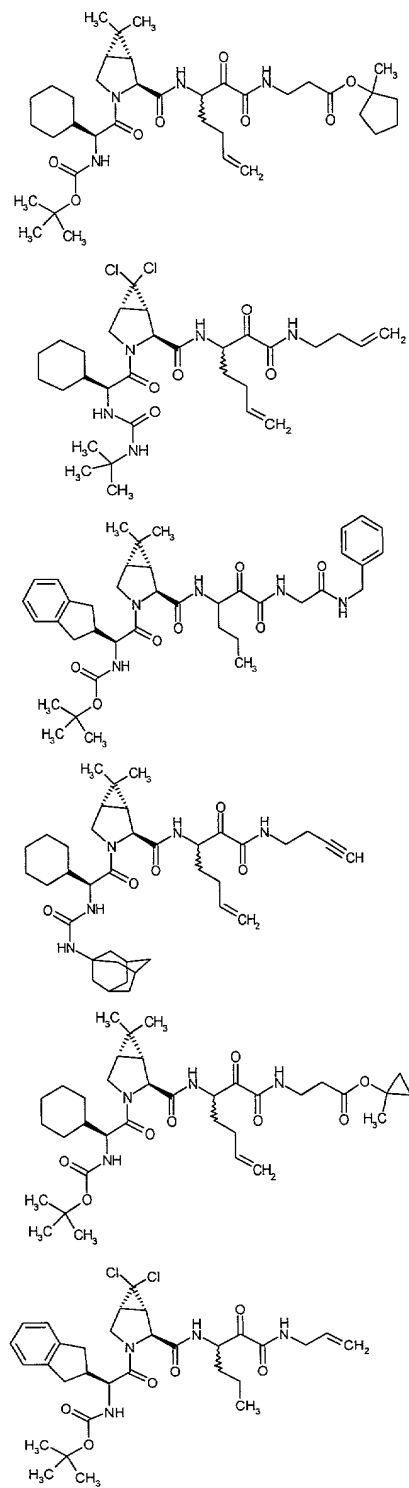


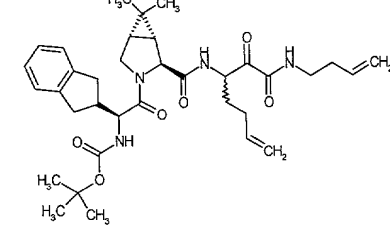
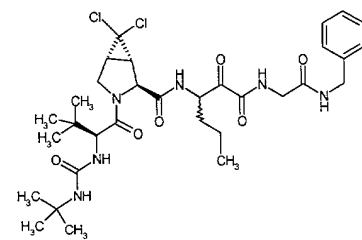
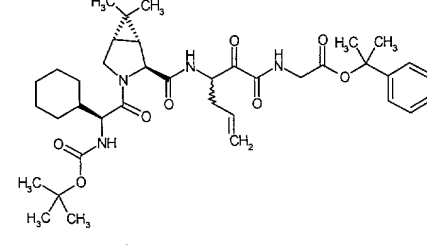
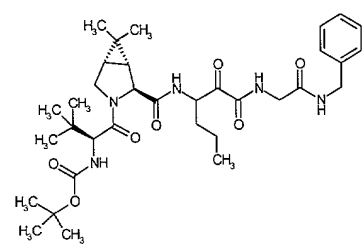
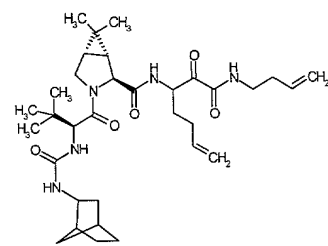
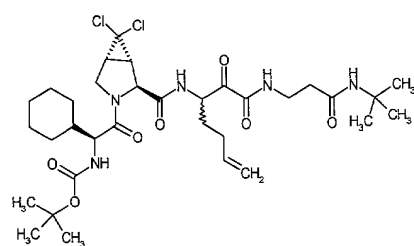
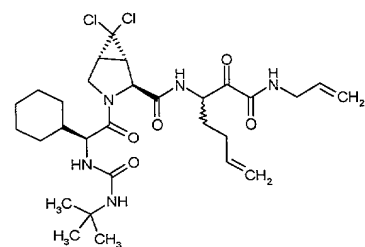
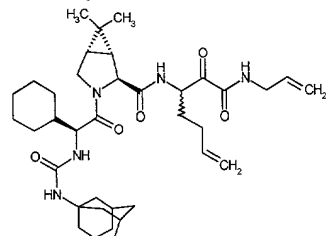
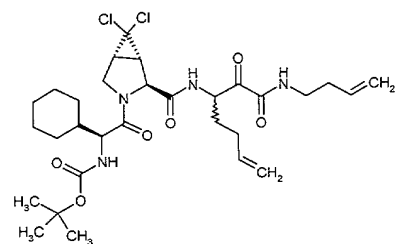
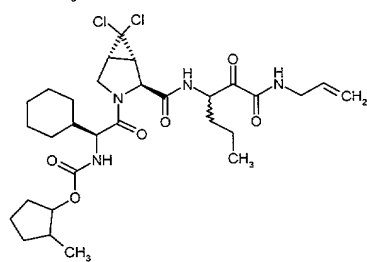
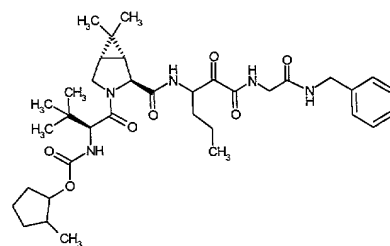
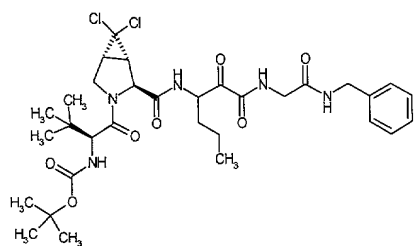


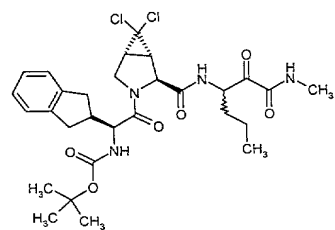
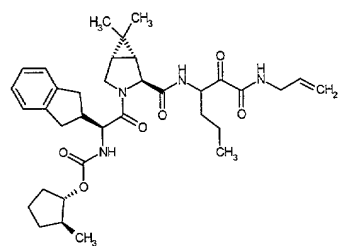
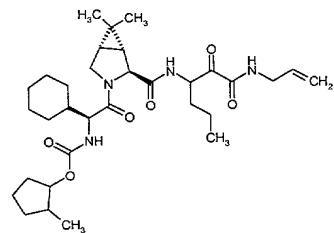
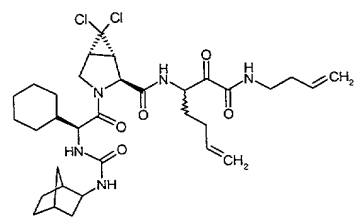
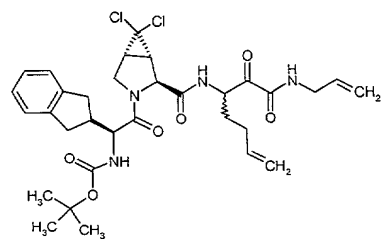
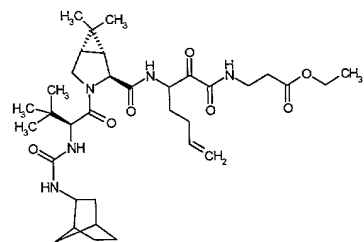
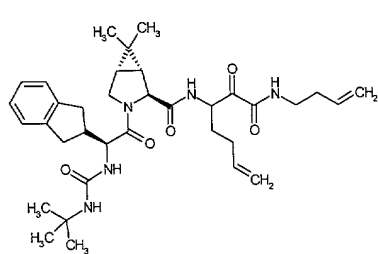
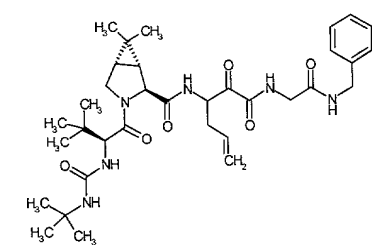
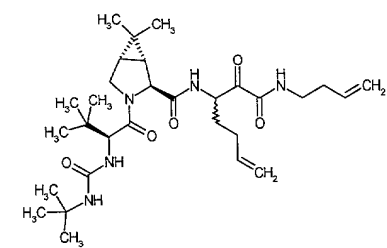
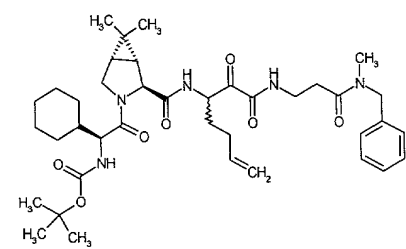
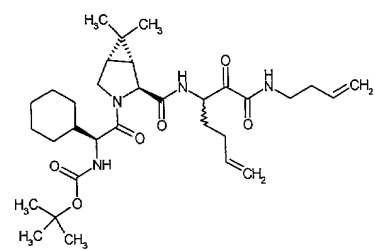
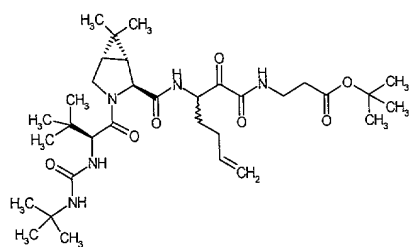


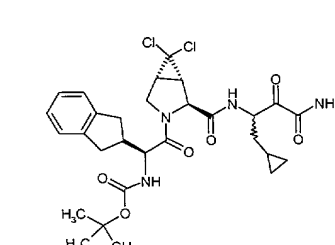
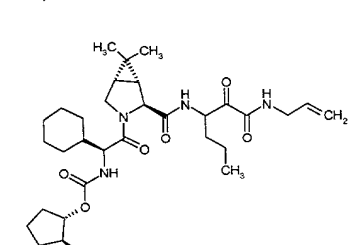
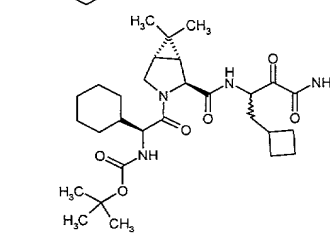
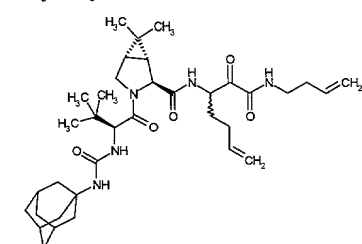
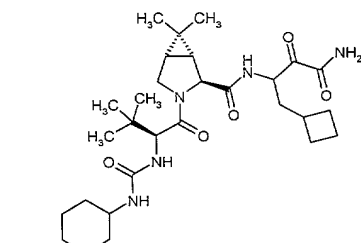
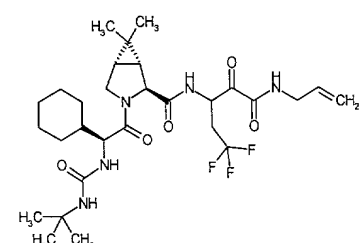
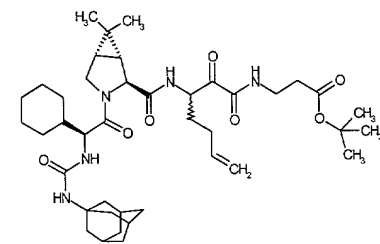
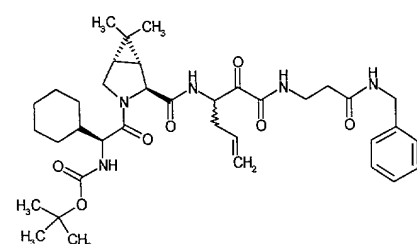
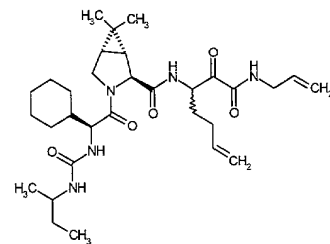
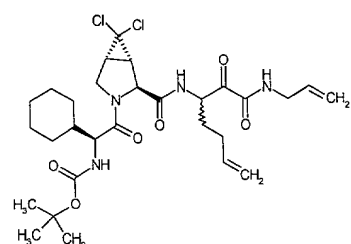
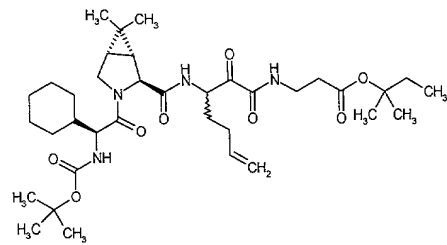
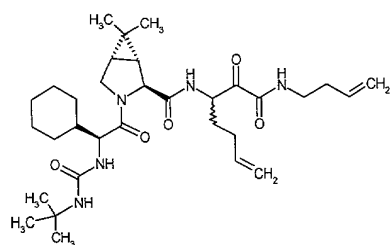






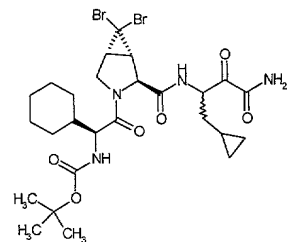
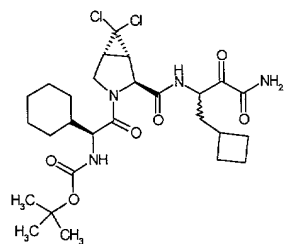




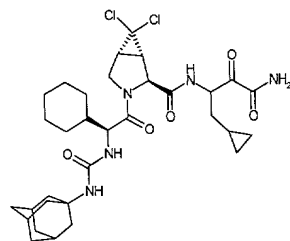
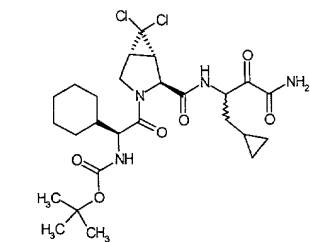
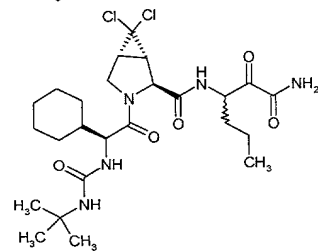
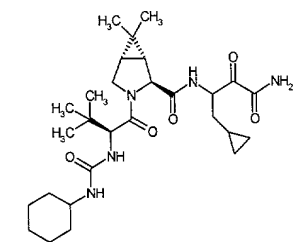
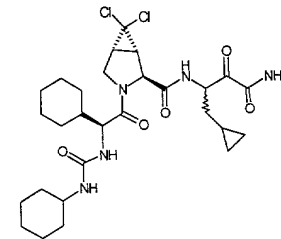
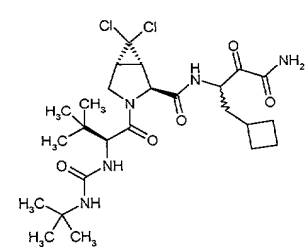
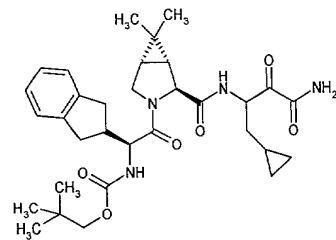
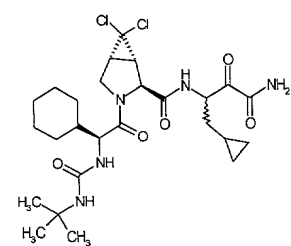
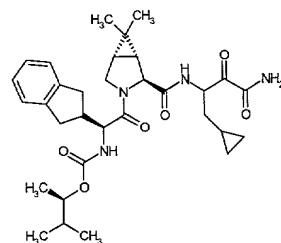
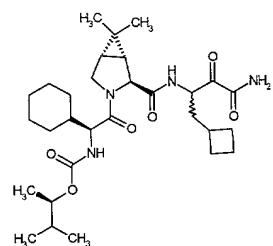




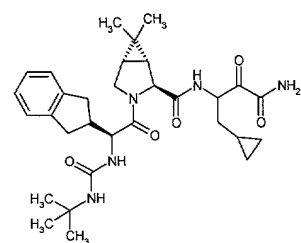
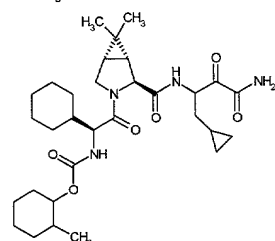
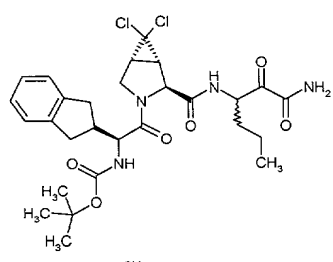
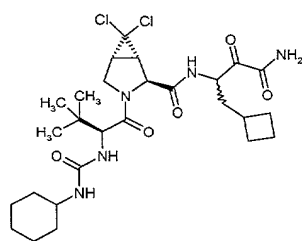
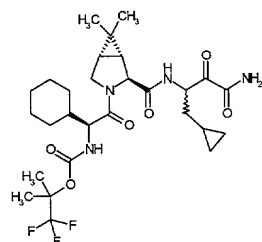
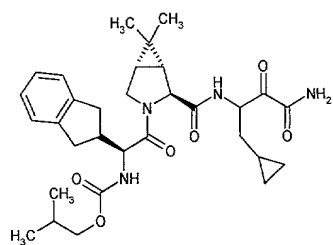
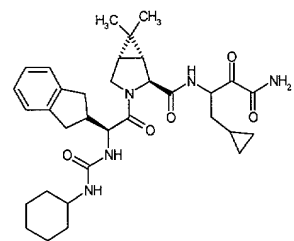
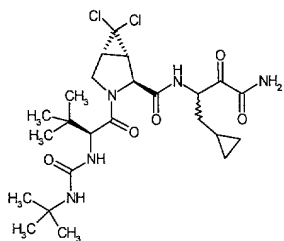
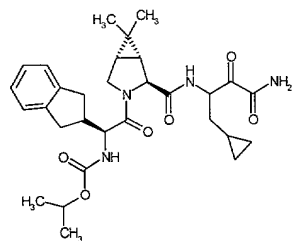
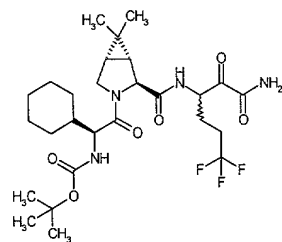
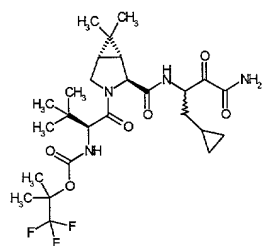
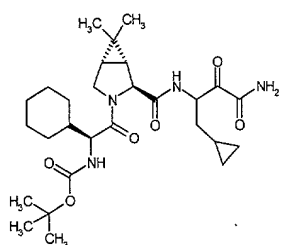
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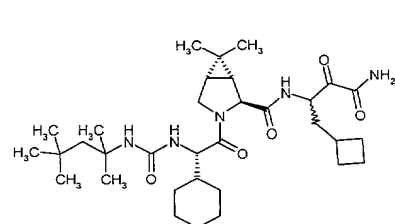
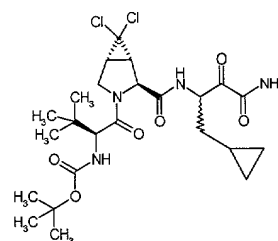
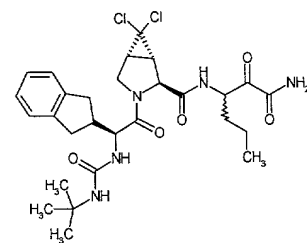
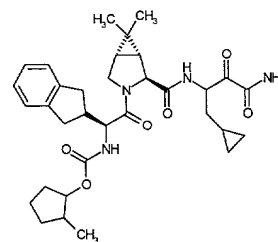
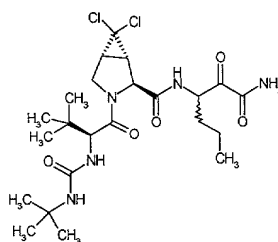
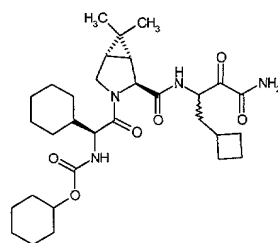
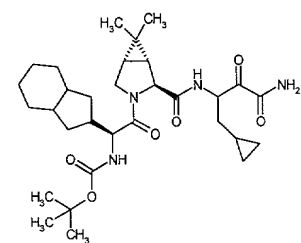
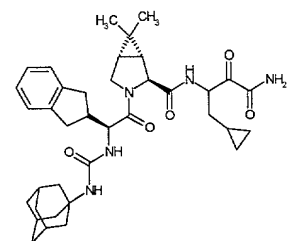
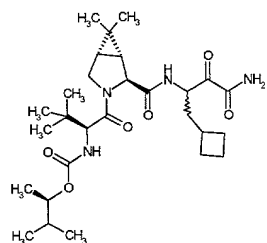
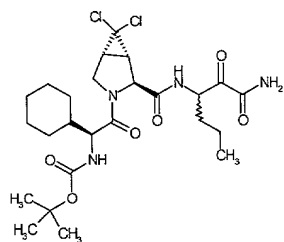
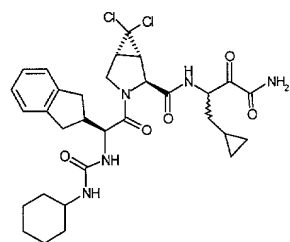
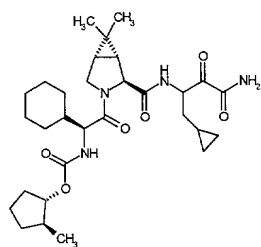


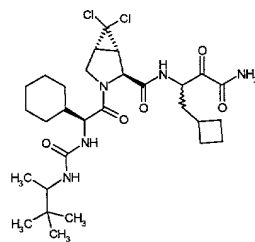
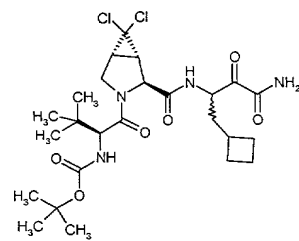
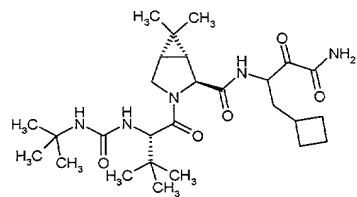
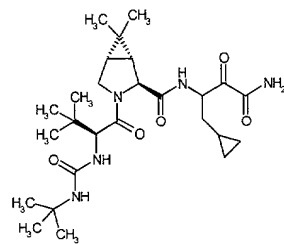
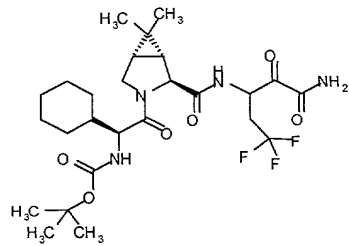
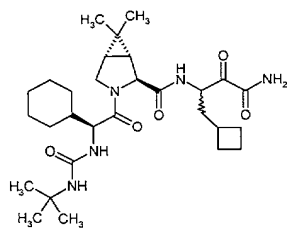
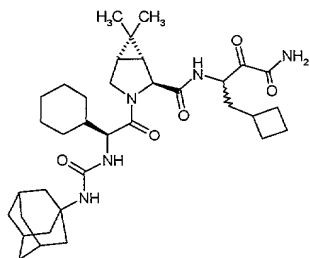
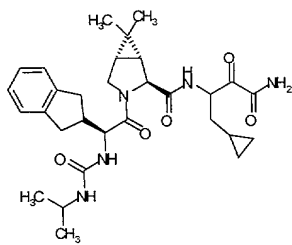
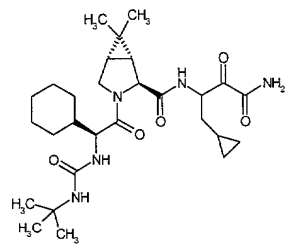
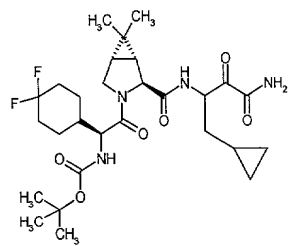
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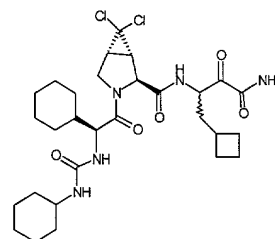
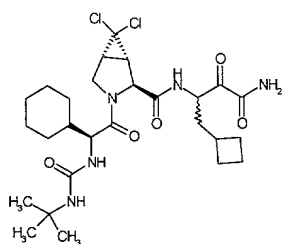
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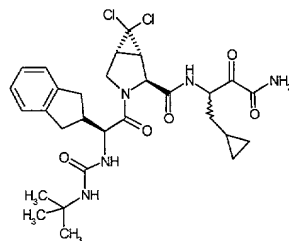
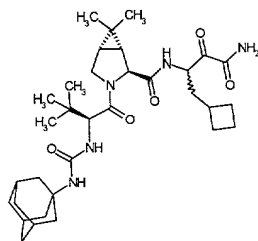




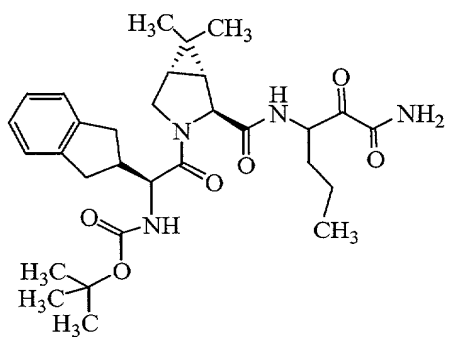
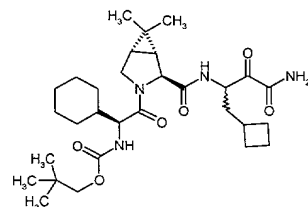
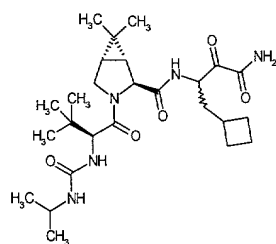
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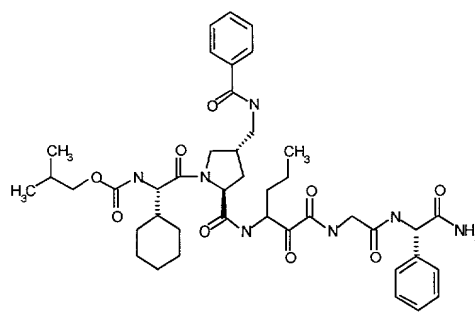
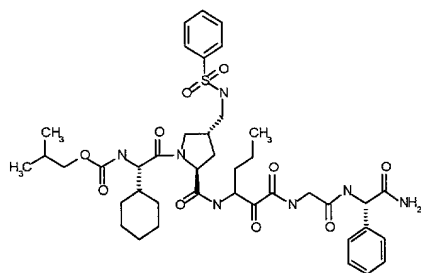
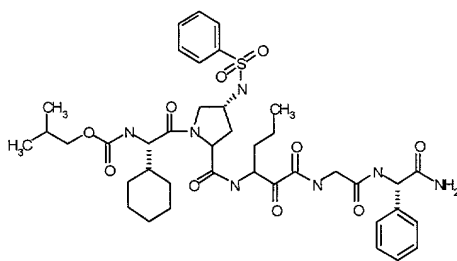
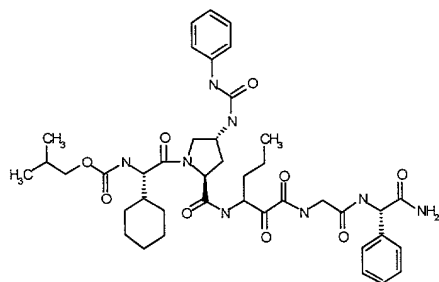
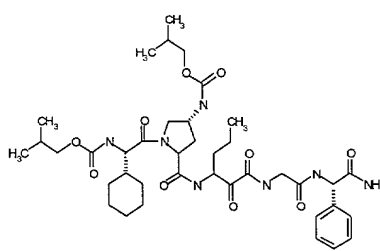
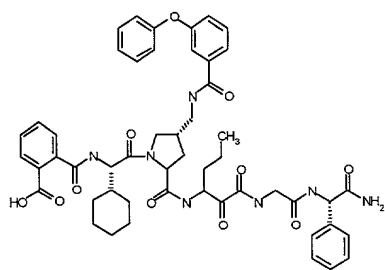
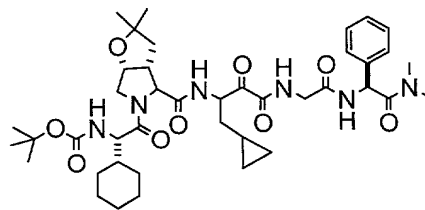
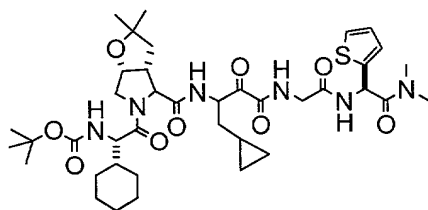
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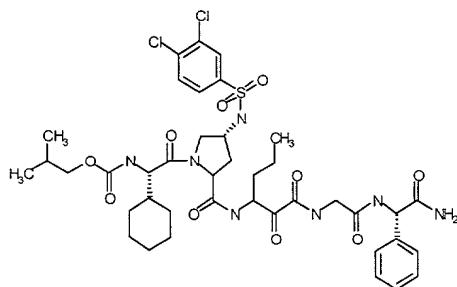
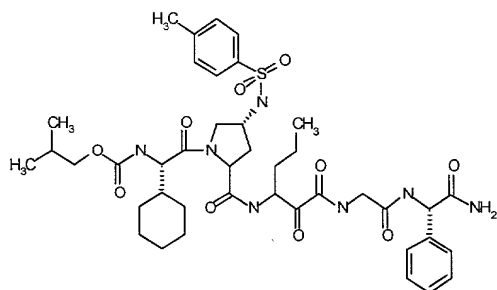
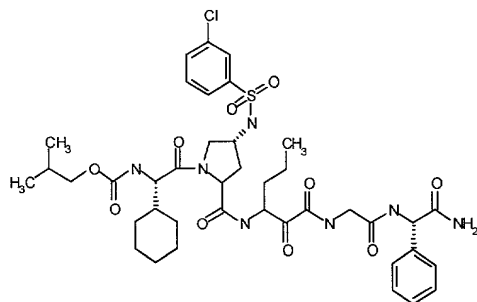
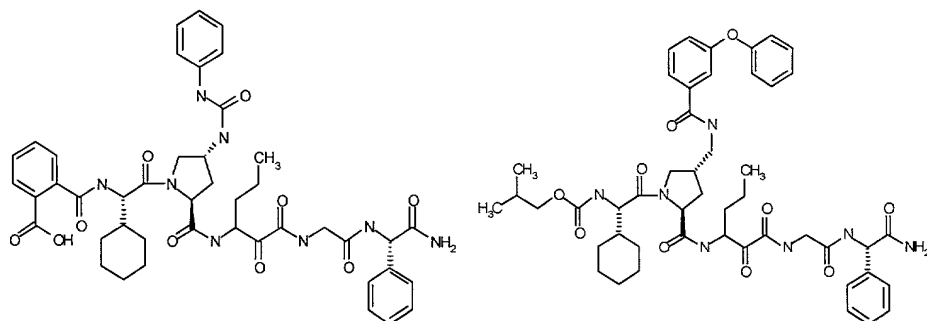


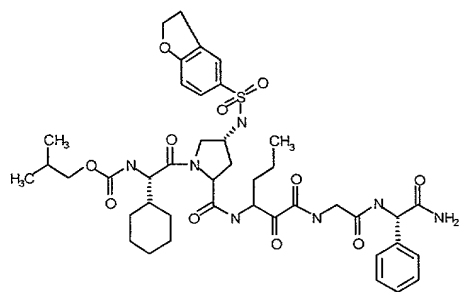
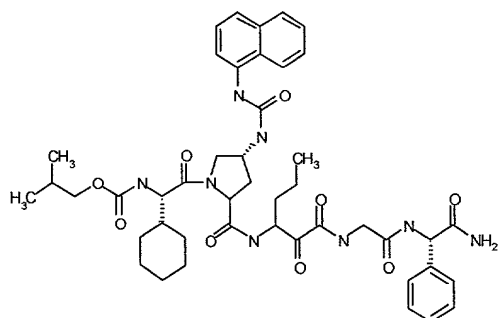
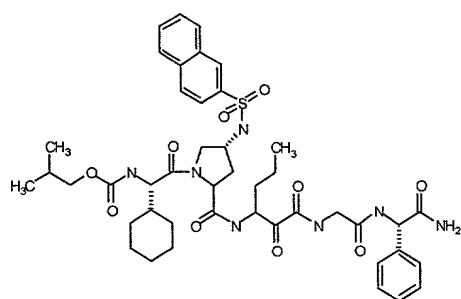
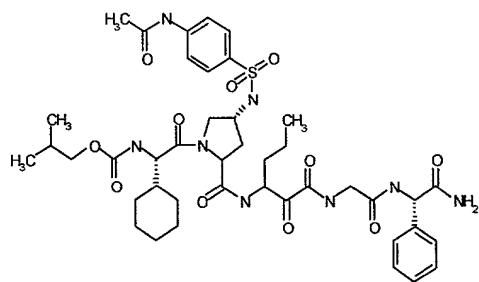
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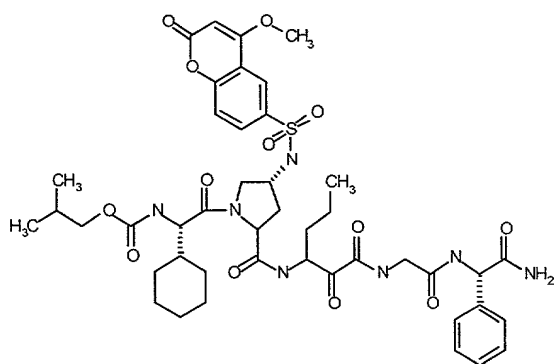
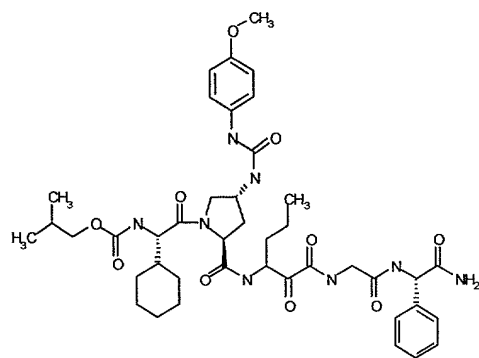
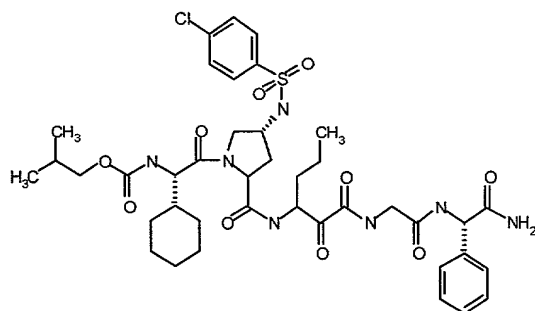
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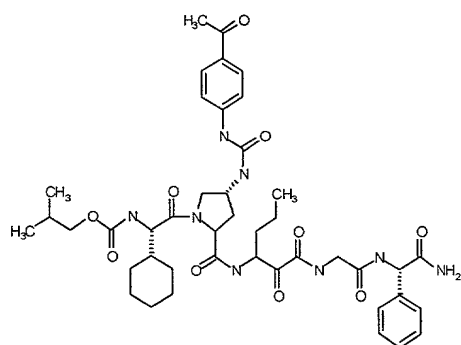
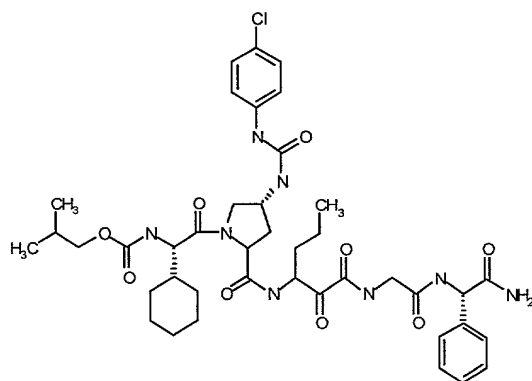
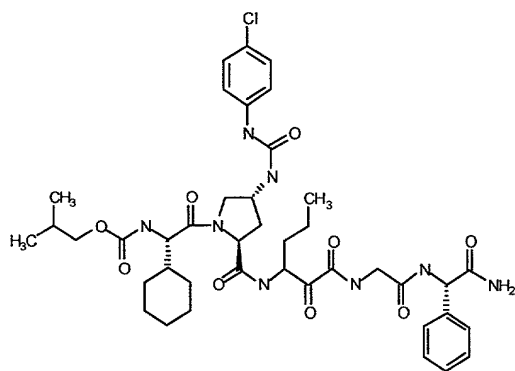


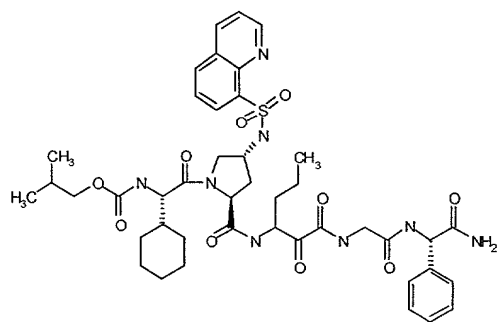
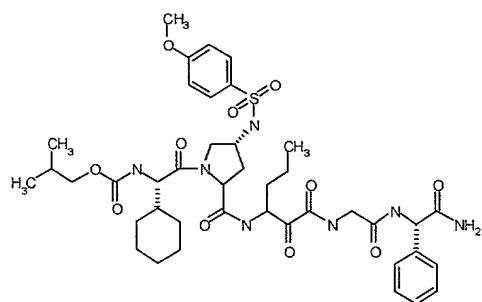
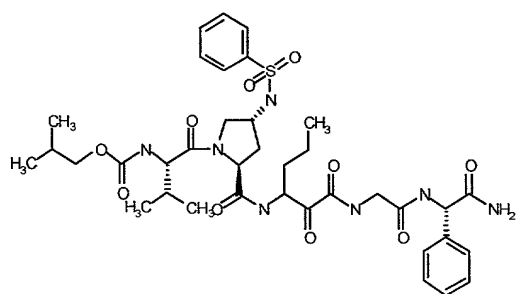
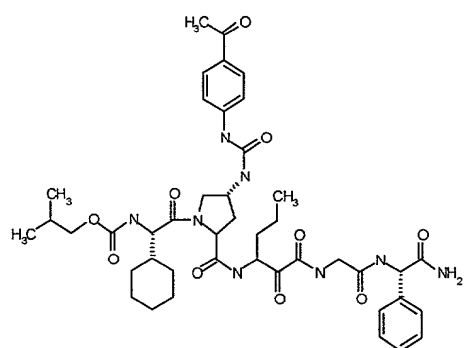


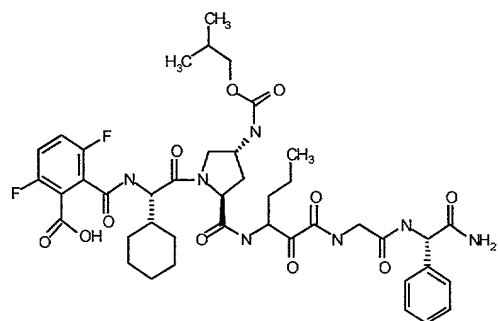
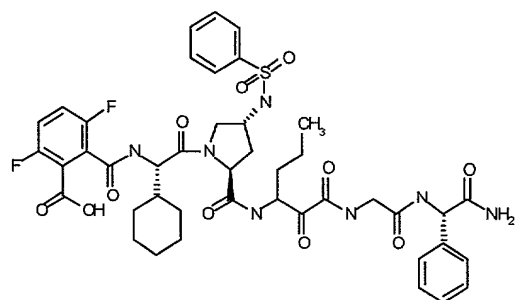
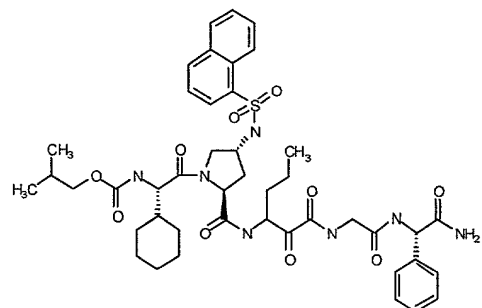


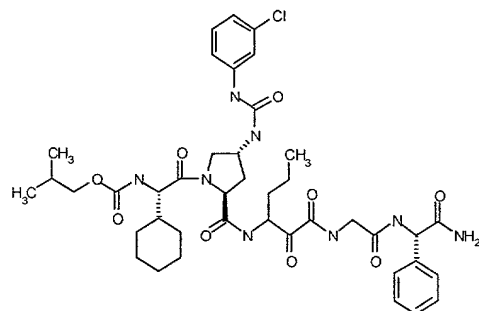
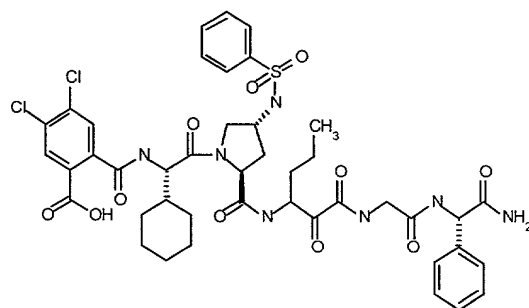
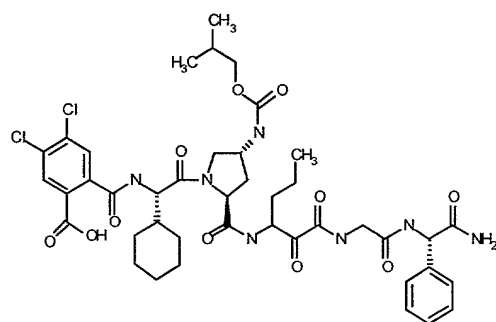
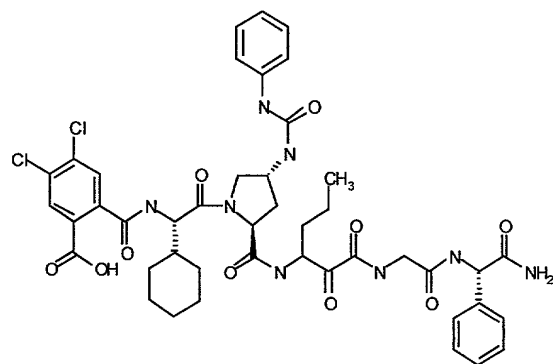


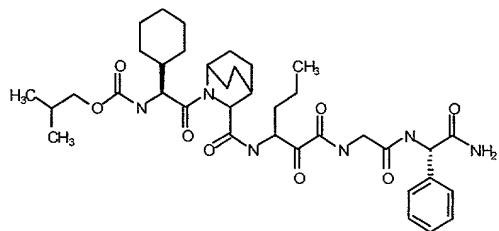
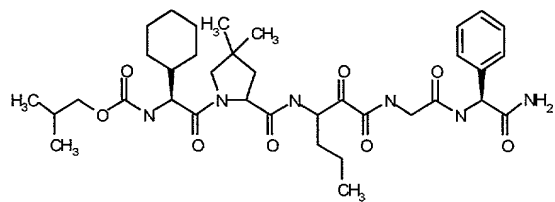
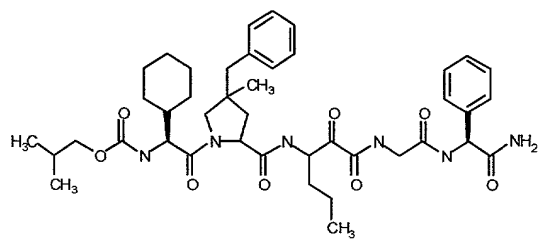
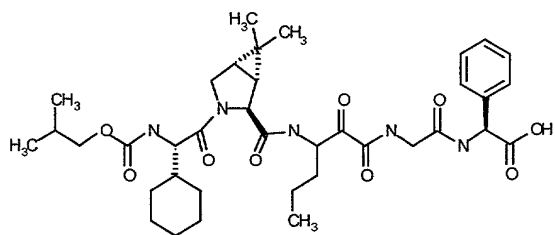


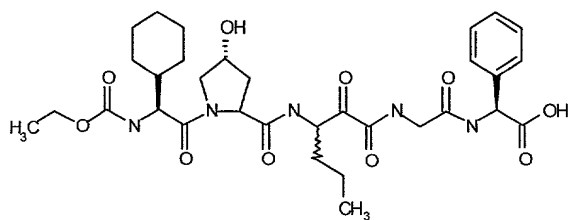
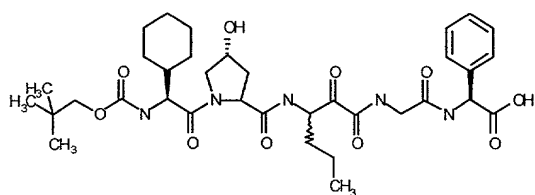
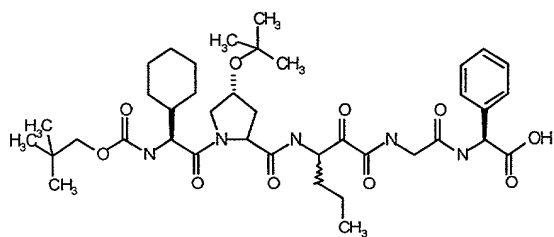
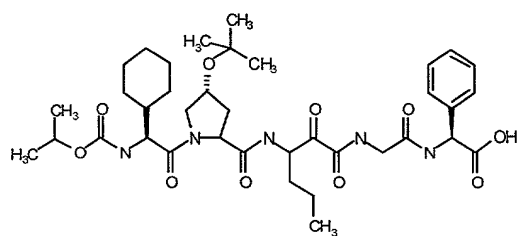
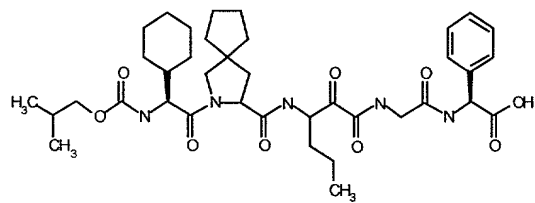


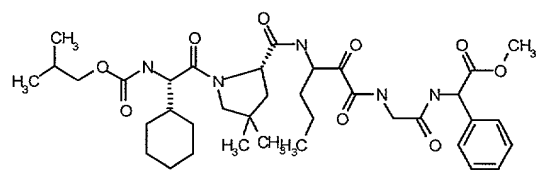
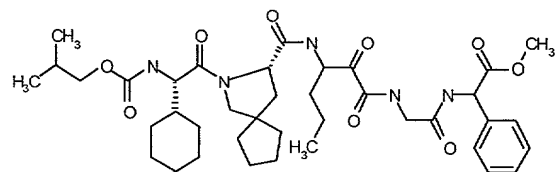
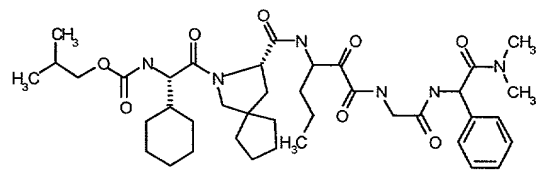
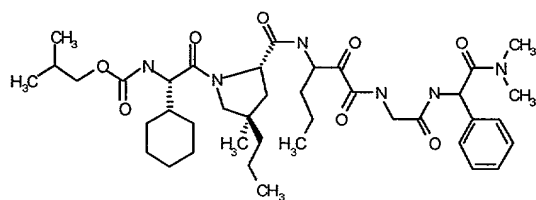
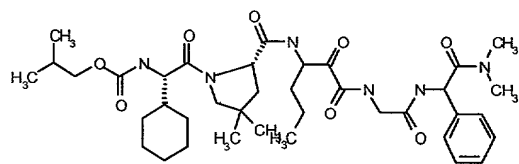
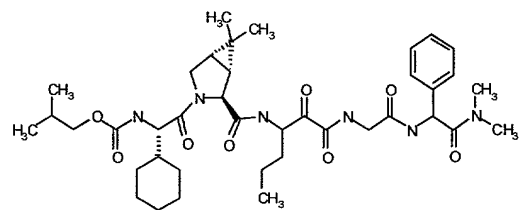




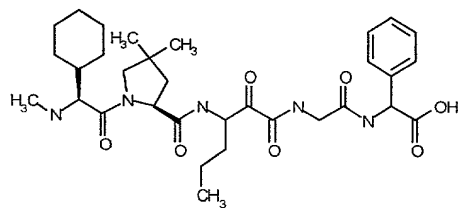
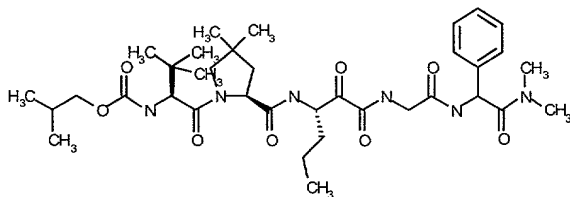
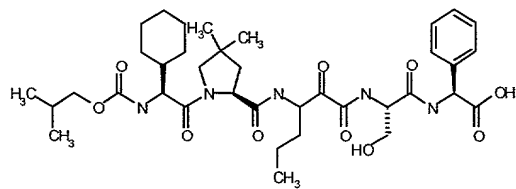
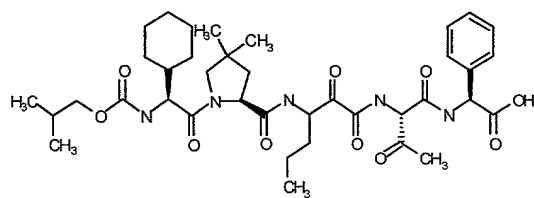
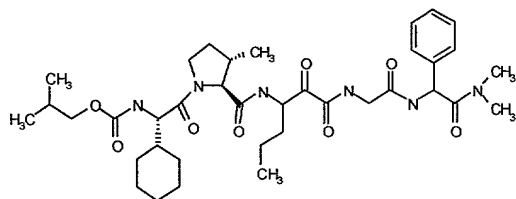
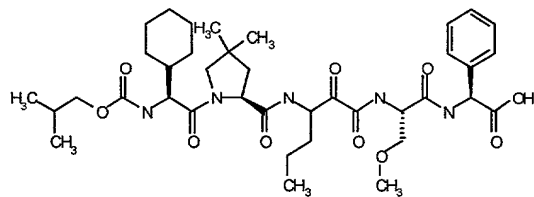


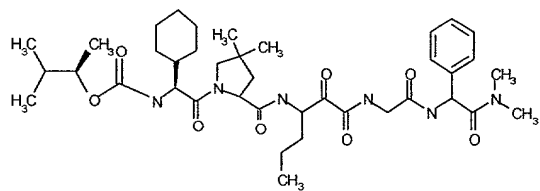
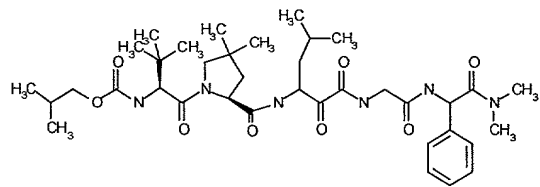
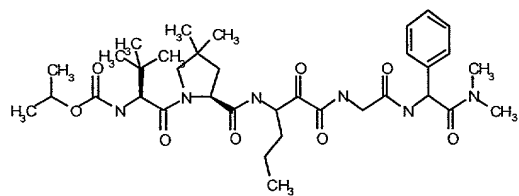
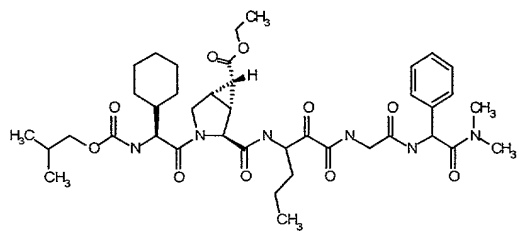
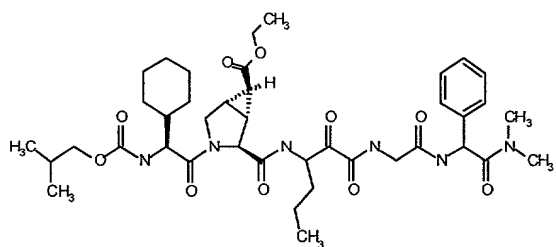
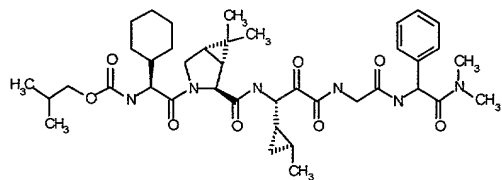


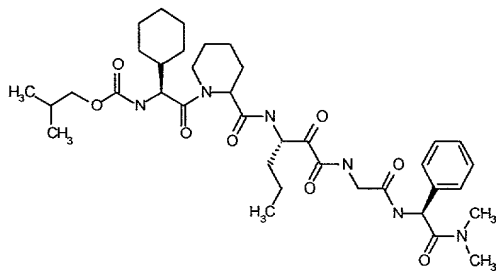
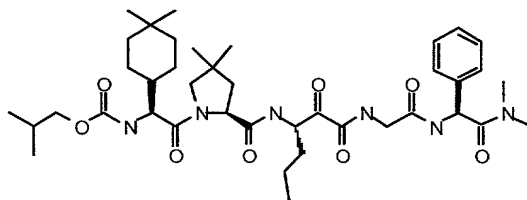
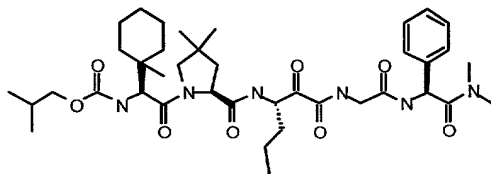
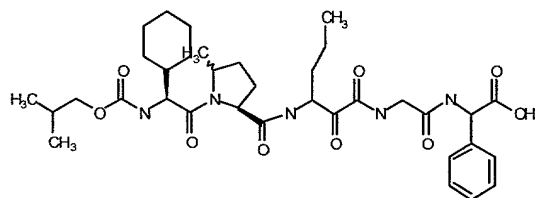
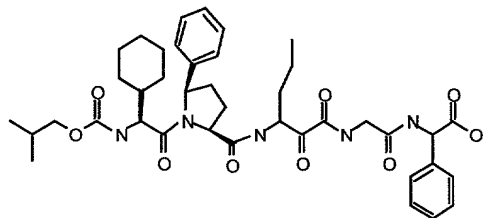


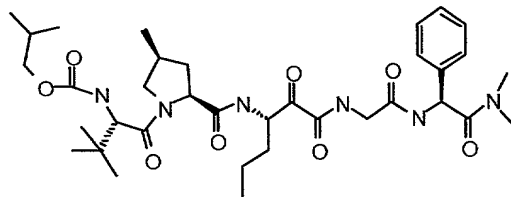
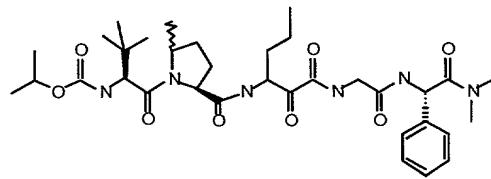
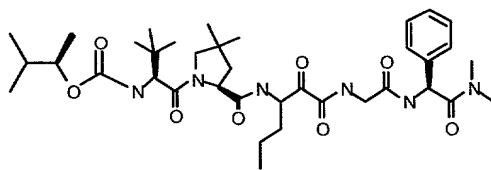
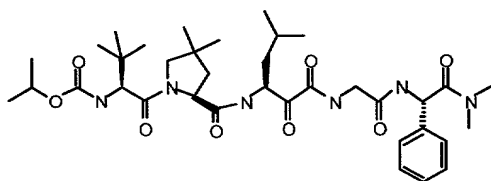
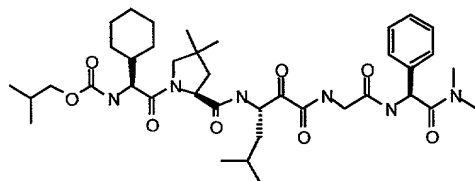
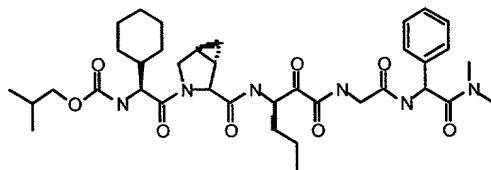


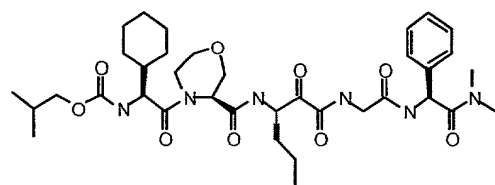
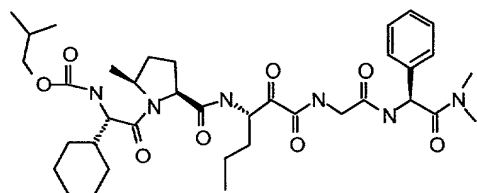
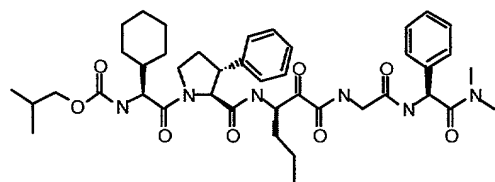
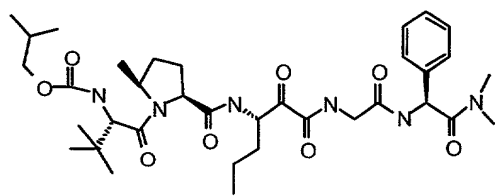
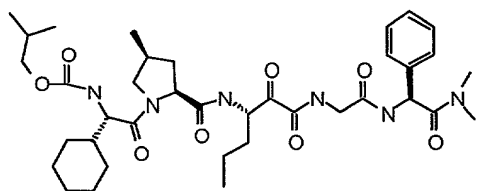
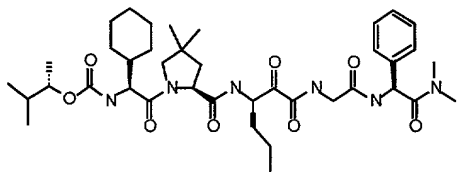


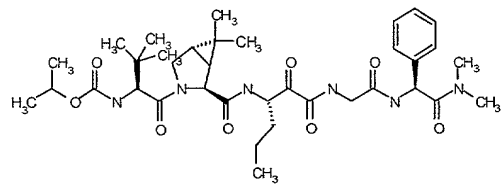
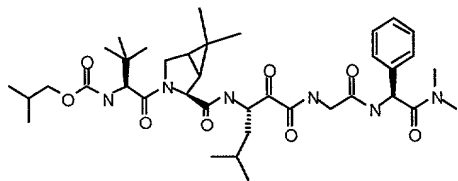
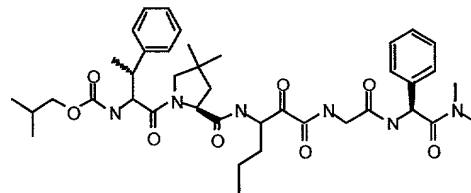
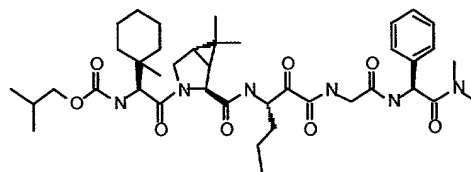
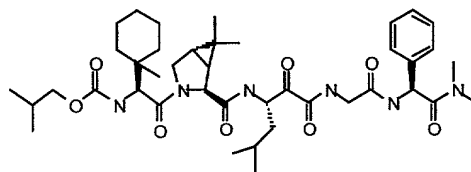
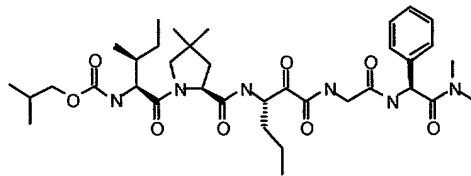


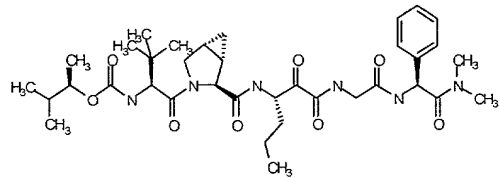
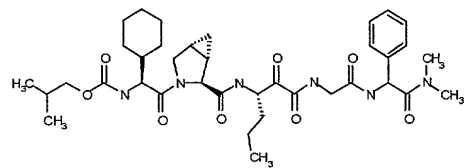
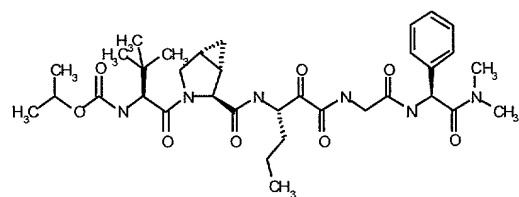
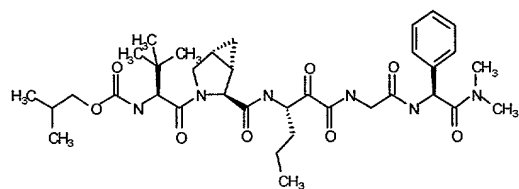
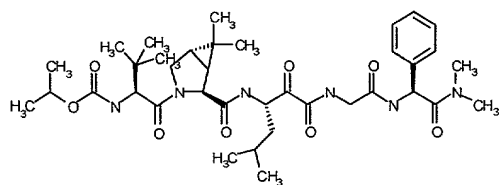
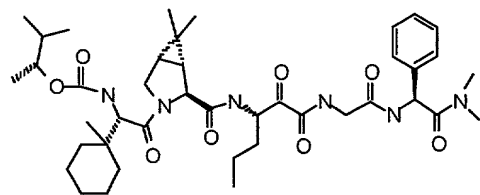


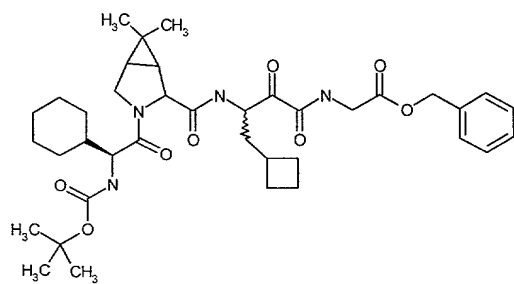
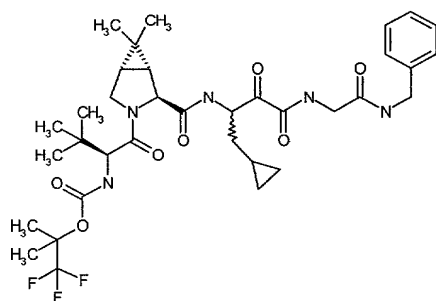
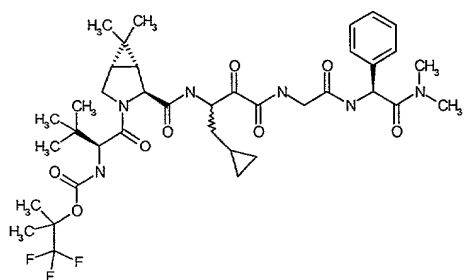
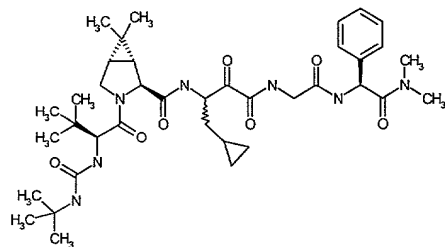
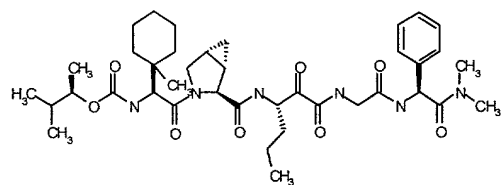




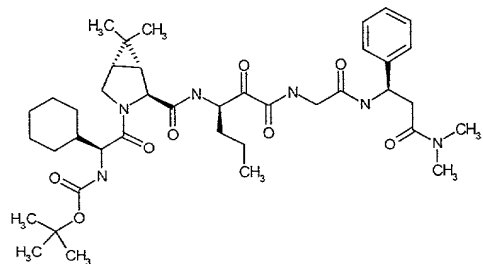
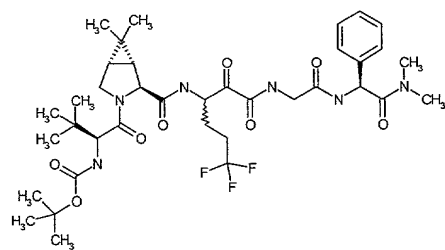
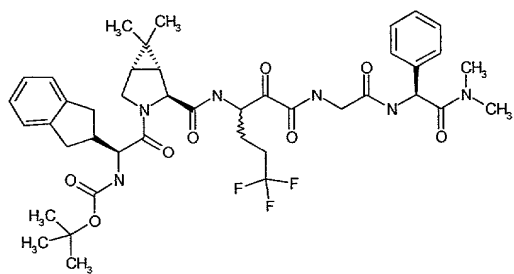
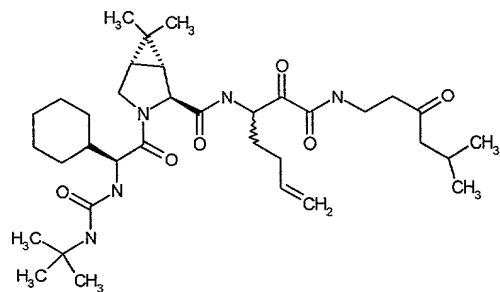


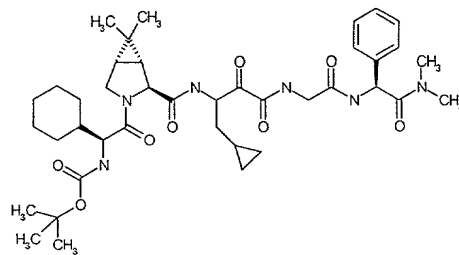
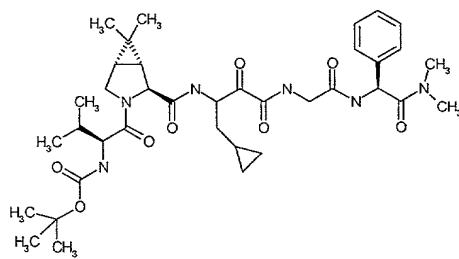
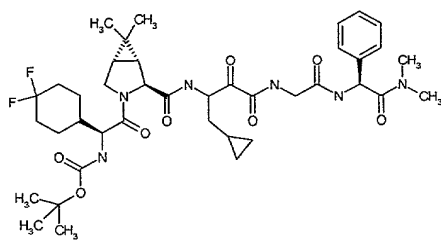
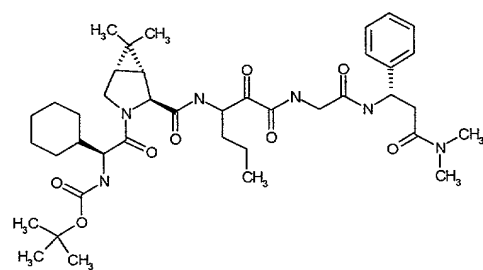
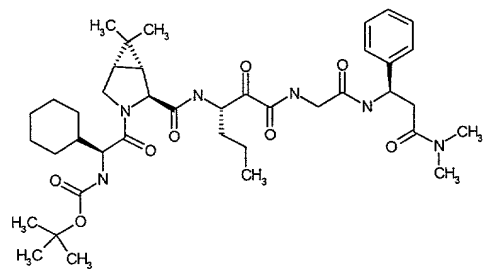


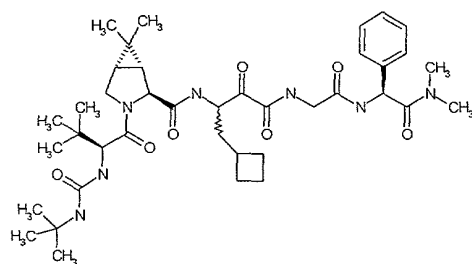
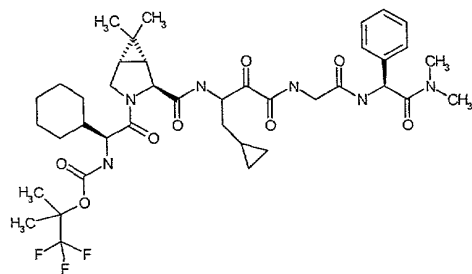
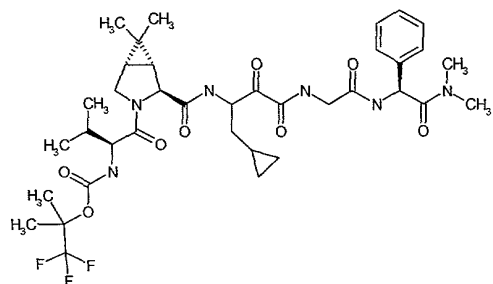
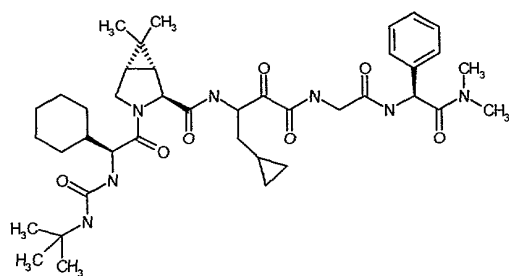
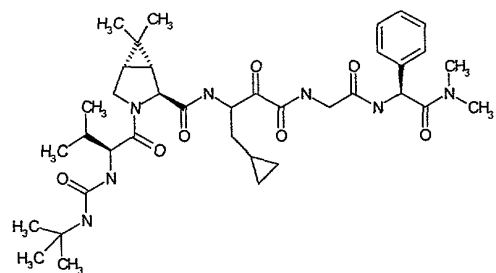


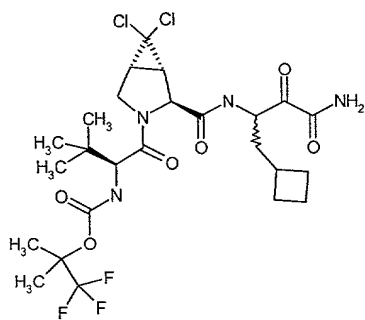
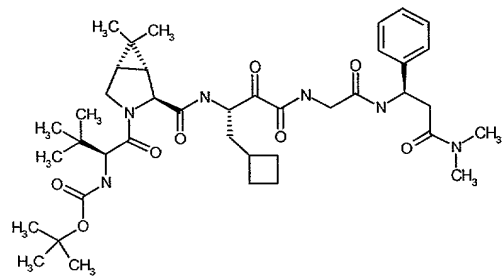
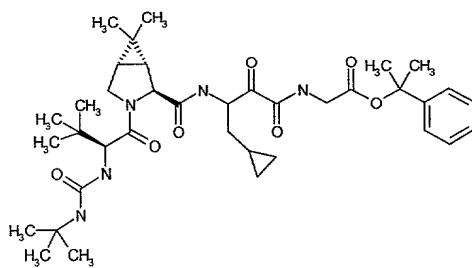


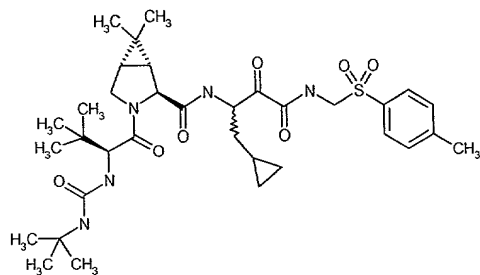
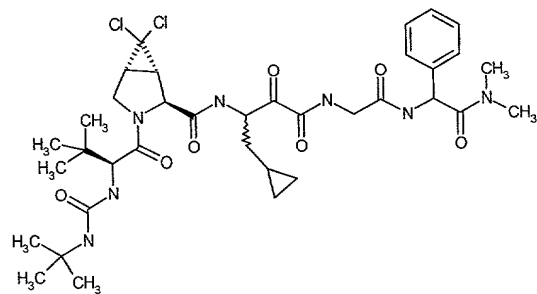
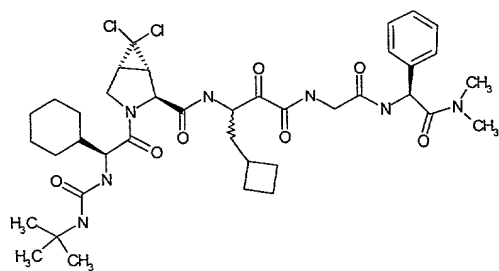
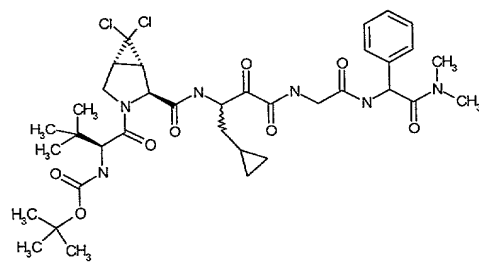
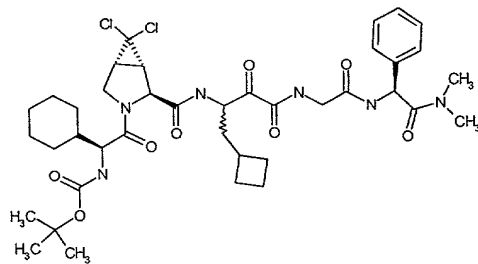


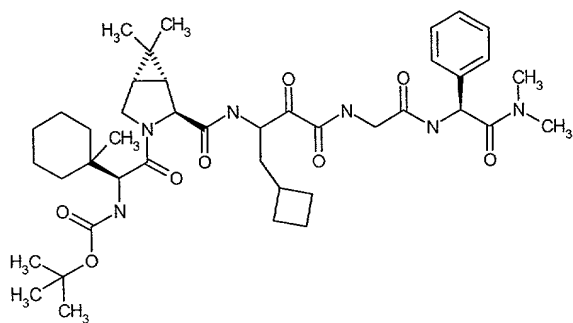
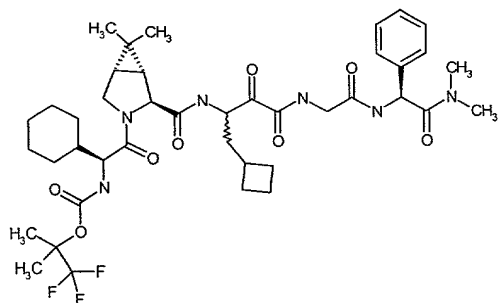
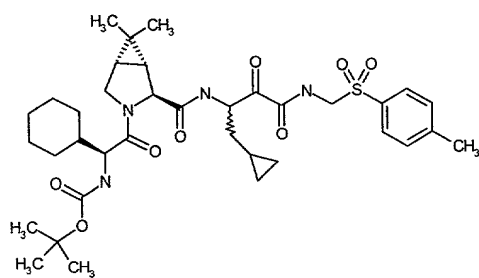


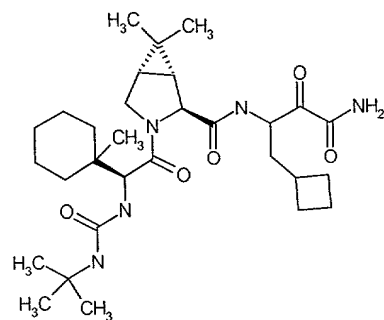
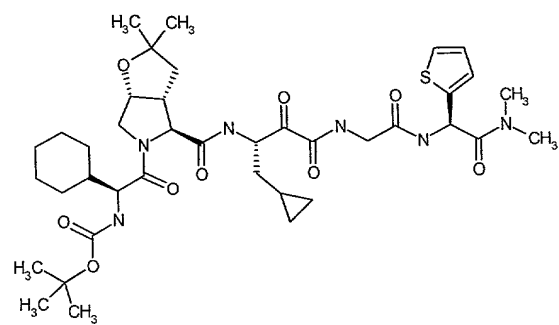
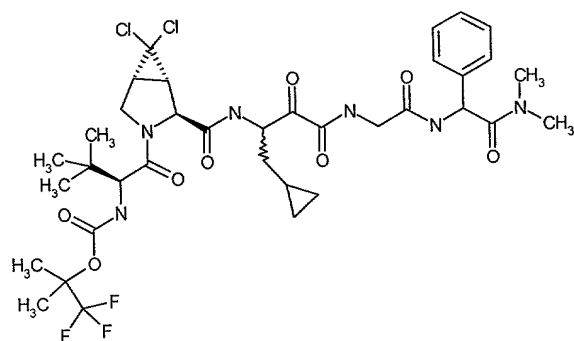
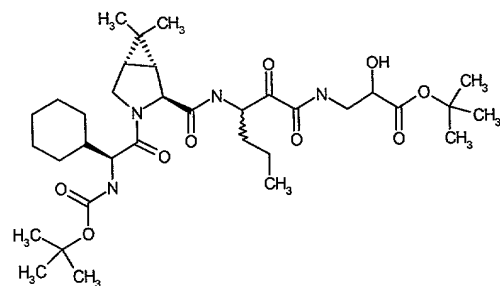


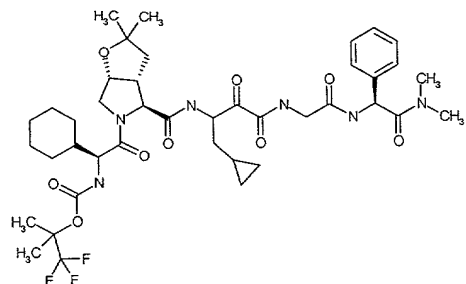
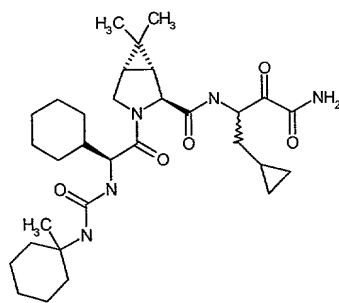
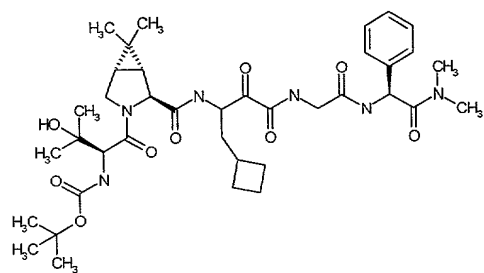
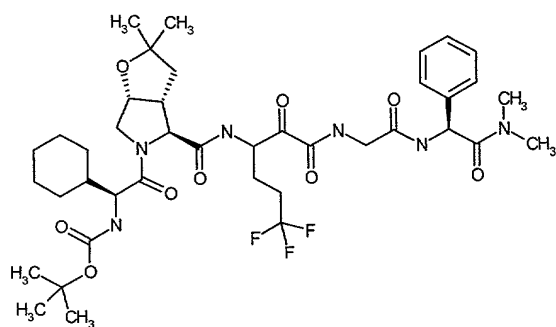




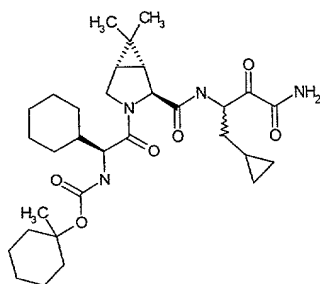
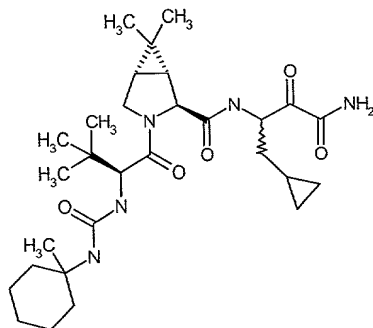
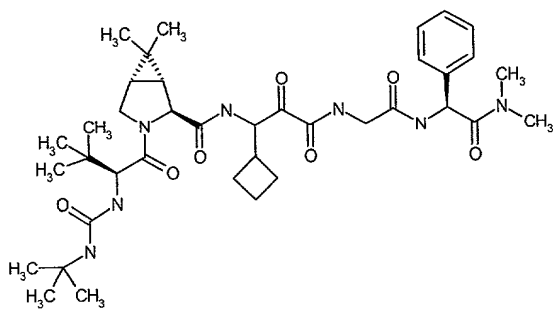
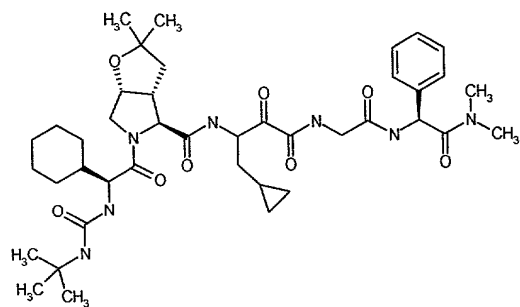


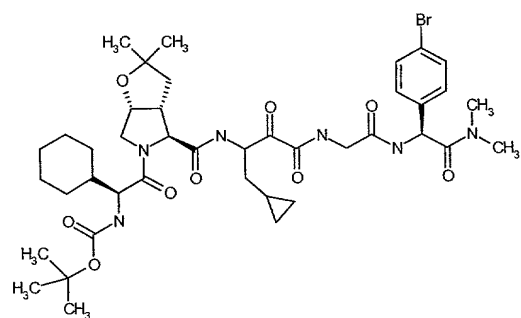
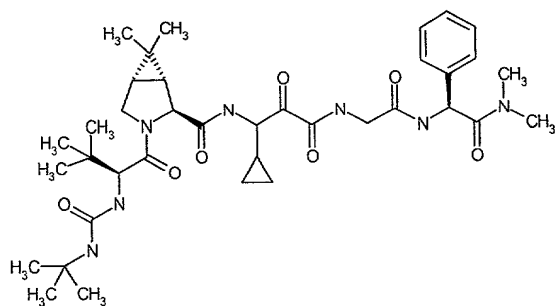
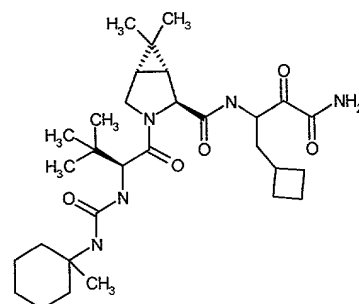
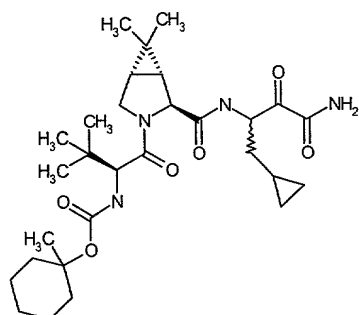


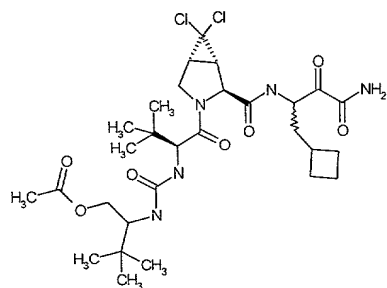
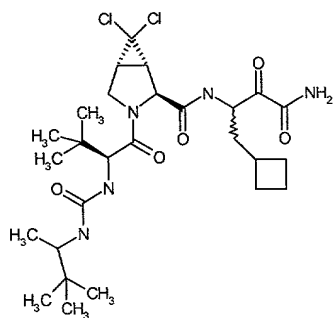
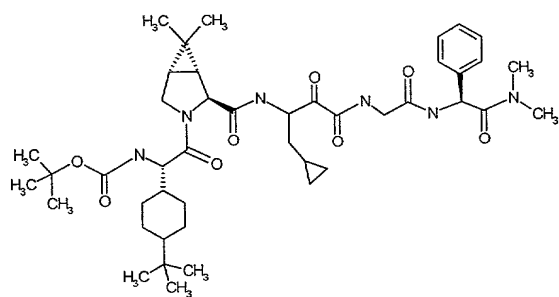
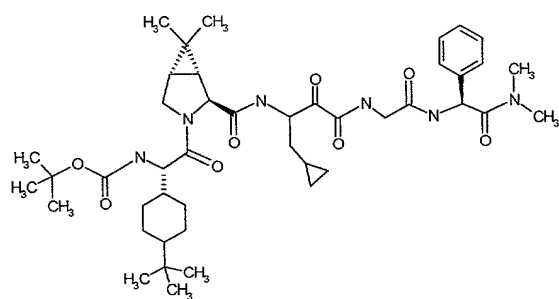


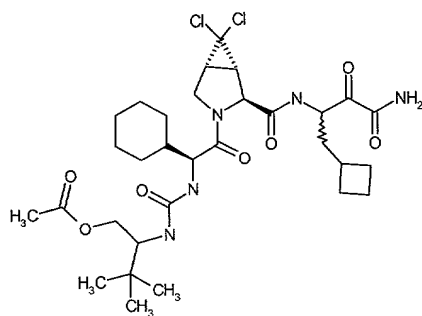
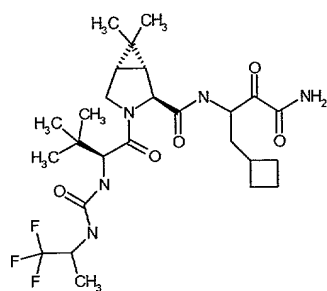
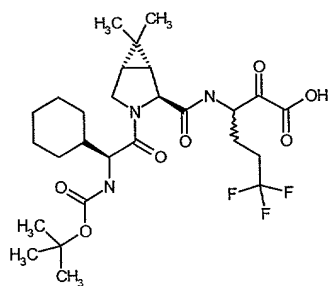
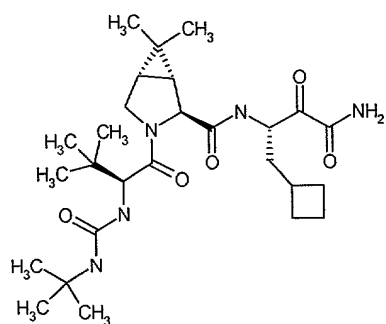




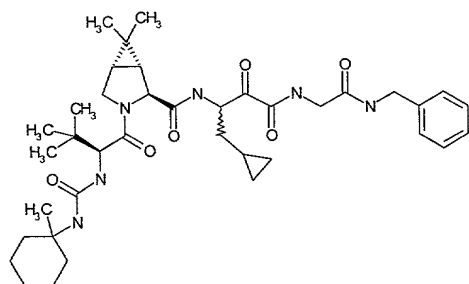
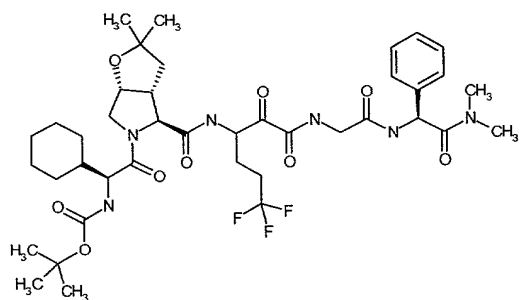
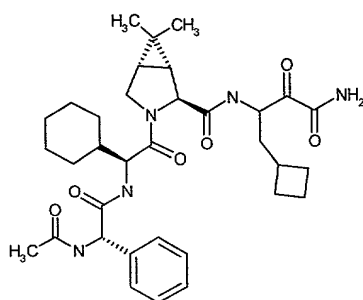
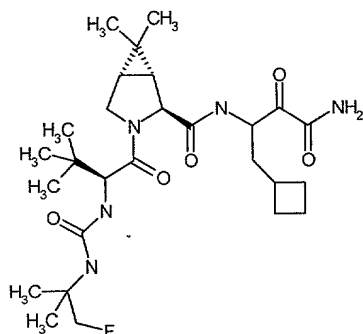


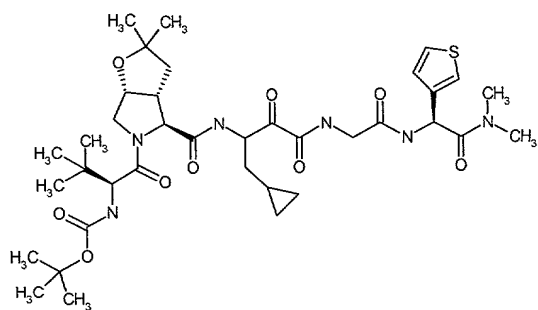
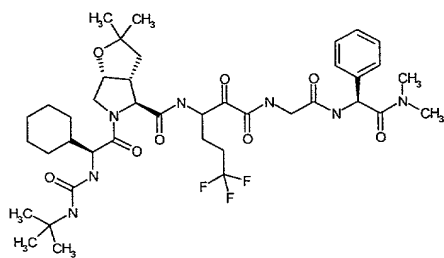
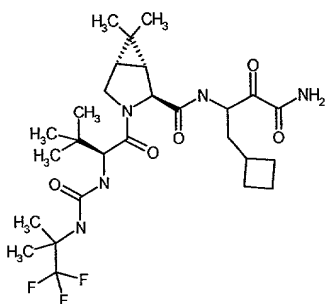


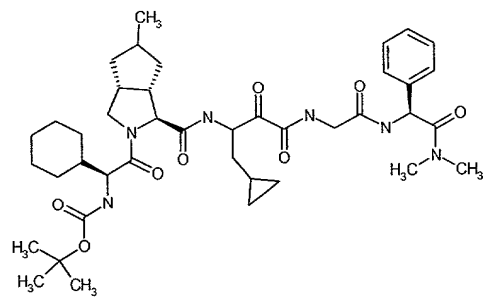
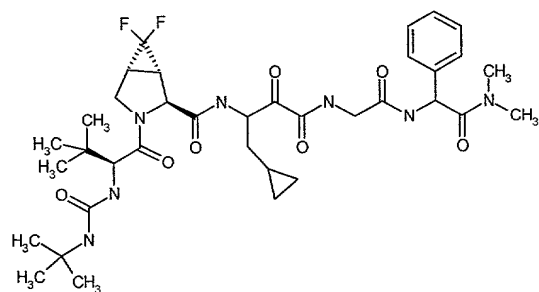
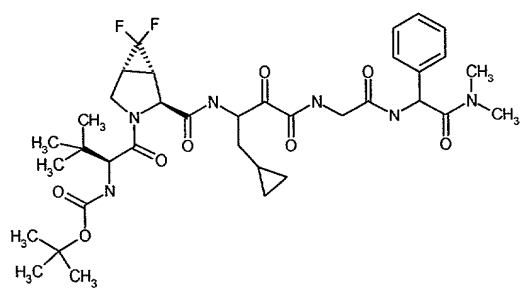
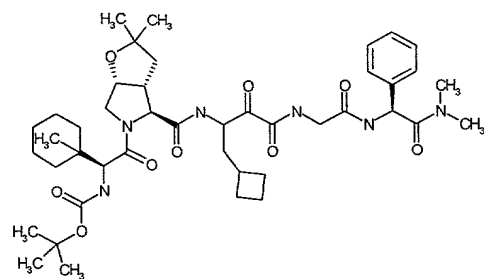




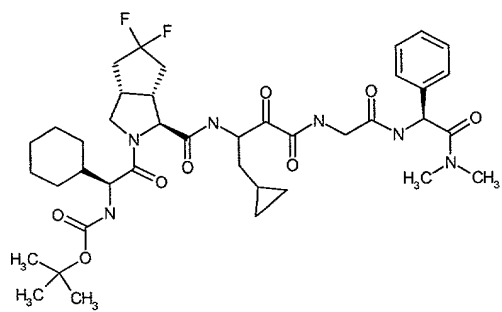
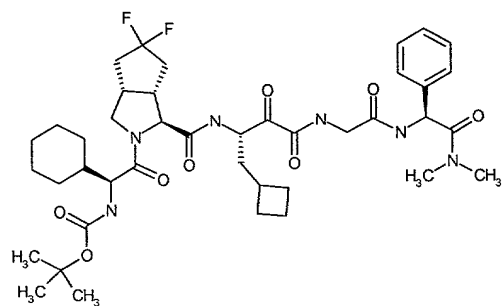
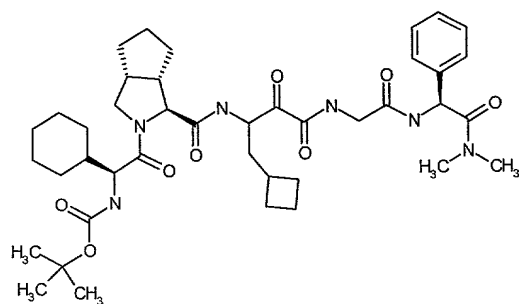
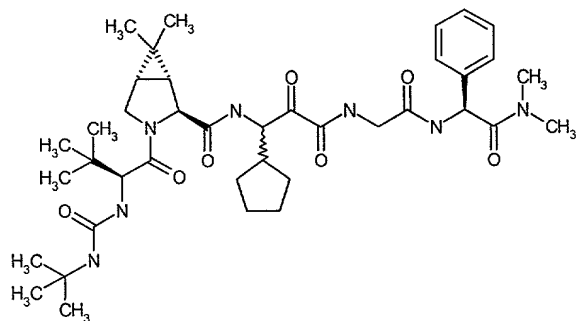


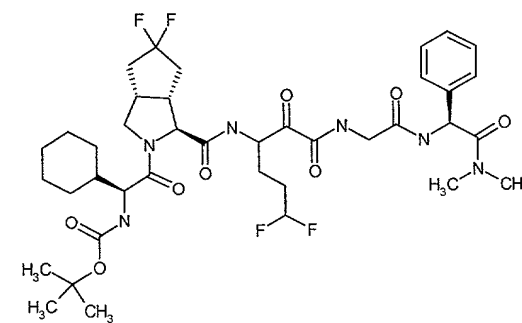
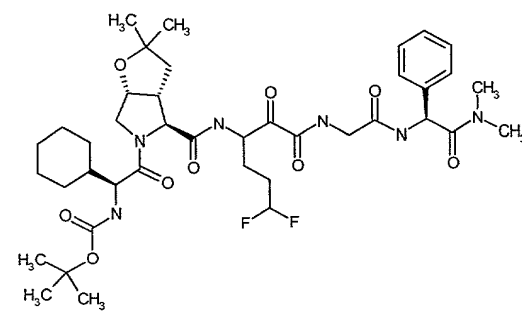
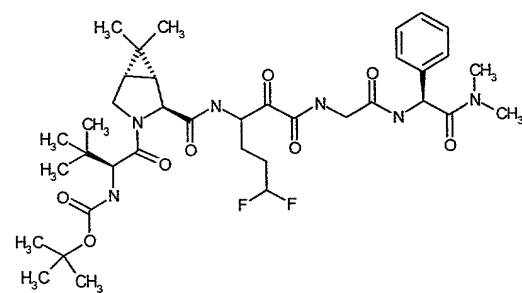
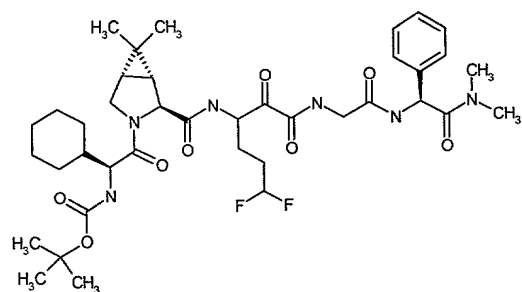


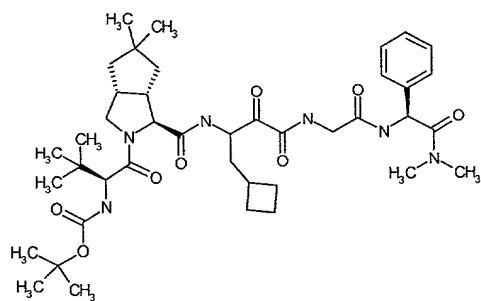
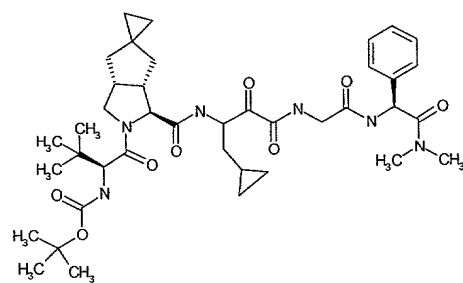
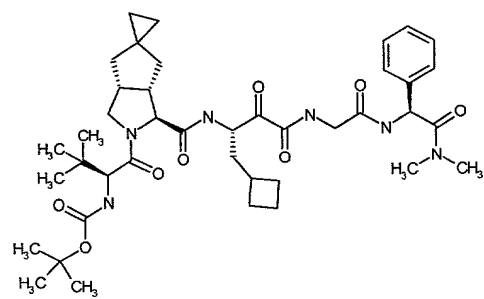
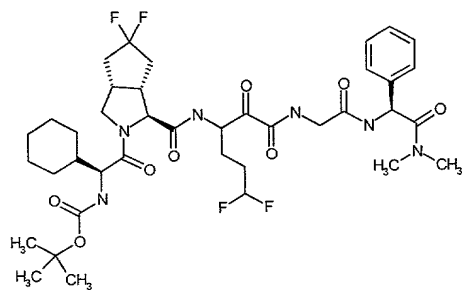


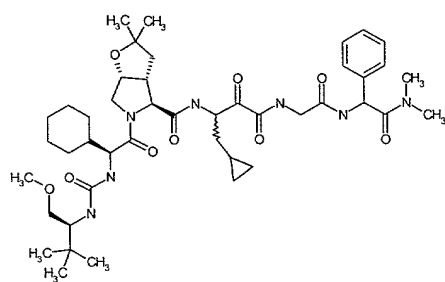
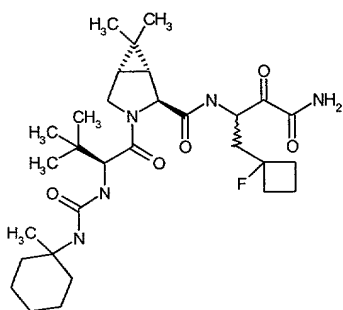
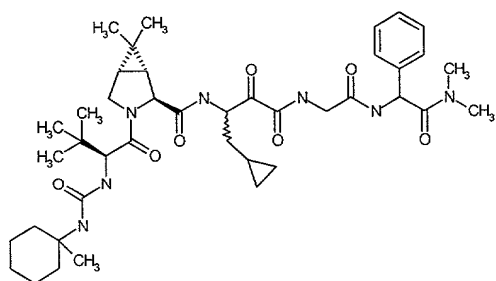
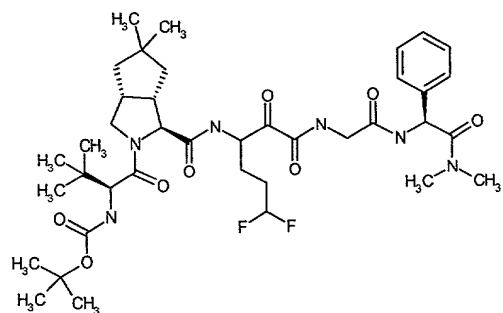


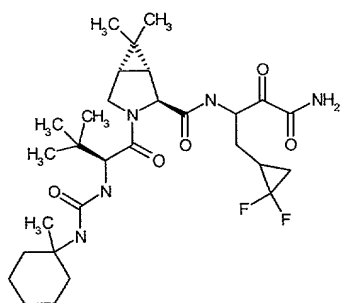
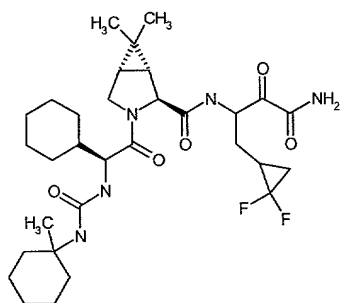
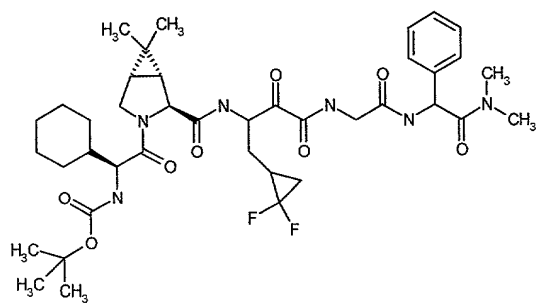


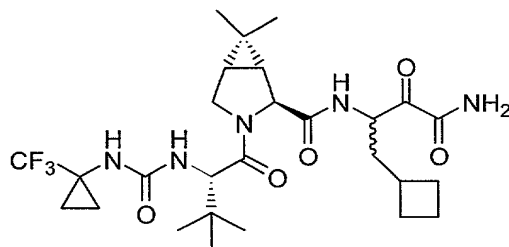
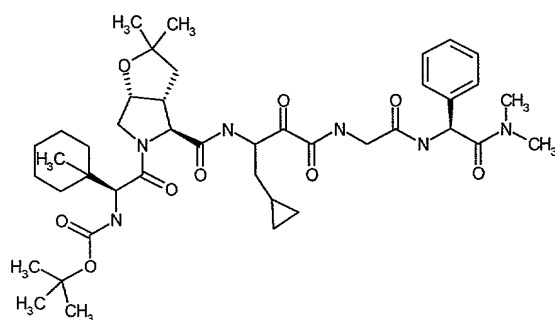
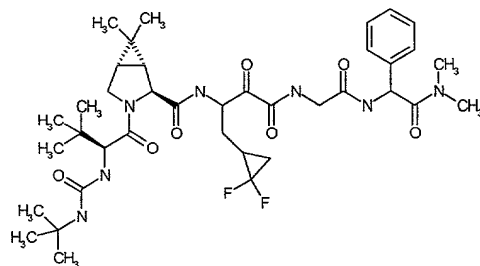












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41. A pharmaceutical composition for treating disorders associated with the HCV, said composition comprising therapeutically effective amount of one or more compounds in claim 39 and a pharmaceutically acceptable carrier.

42. The pharmaceutical composition of claim 41, additionally containing an  
10 antiviral agent.

43. The pharmaceutical composition of claim 42, still additionally containing an interferon or PEG-interferon alpha conjugate.

44. The pharmaceutical composition of claim 43, wherein said antiviral agent is ribavirin and said interferon is  $\alpha$ -interferon.

45. A method of treatment of a hepatitis C virus associated disorder,  
15 comprising administering an effective amount of one or more compounds of claim 40.

46. A method of modulating the activity of hepatitis C virus (HCV) protease, comprising contacting HCV protease with one or more compounds of claim 39.

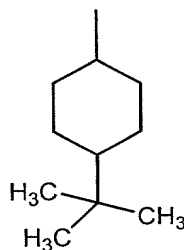
47. A method of treating, preventing, or ameliorating one or more symptoms of hepatitis C, comprising administering an effective amount of one or more compounds of claim 40.

48. The method of claim 46, wherein the HCV protease is the NS3/NS4a protease.

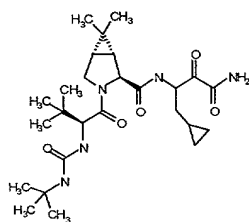
49. The method of claim 48, wherein the compound or compounds inhibit HCV NS3/NS4a protease.

50. A method of modulating the processing of hepatitis C virus (HCV) polypeptide, comprising contacting a composition containing the HCV polypeptide under conditions in which the polypeptide is processed with one or more compounds of claim 40.

51. The compound of claim 8, wherein  $R^3$  is:

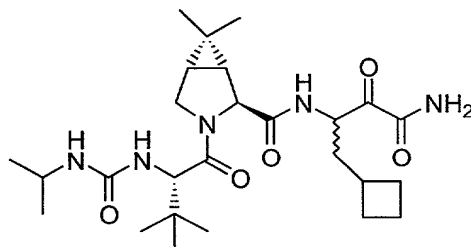


52. A compound exhibiting HCV protease inhibitory activity, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said compound, and pharmaceutically acceptable salts or solvates of said compound, or of said prodrug, said compound being the compound of structure shown below:

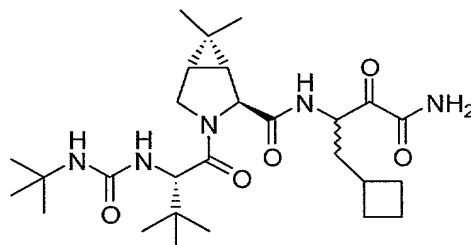


53. A compound exhibiting HCV protease inhibitory activity, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said

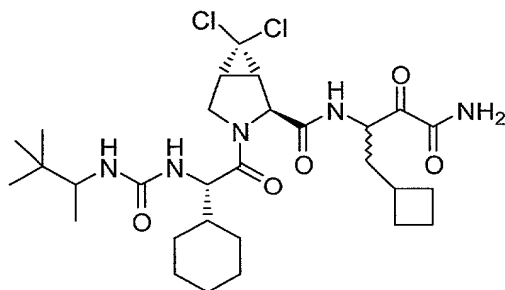
compound, and pharmaceutically acceptable salts or solvates of said compound, or of said prodrug, said compound being the compound of structure shown below:



- 5 54. A compound exhibiting HCV protease inhibitory activity, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said compound, and pharmaceutically acceptable salts or solvates of said compound, or of said prodrug, said compound being the compound of structure shown below:

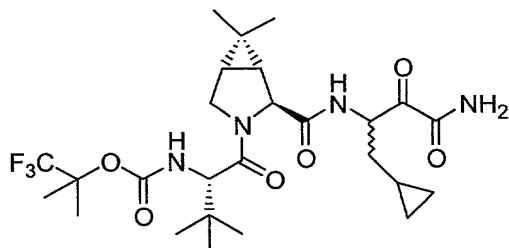


- 10 55. A compound exhibiting HCV protease inhibitory activity, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said compound, and pharmaceutically acceptable salts or solvates of said compound, or of said prodrug, said compound being the compound of structure shown below:

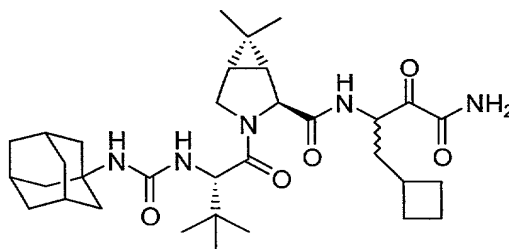


- 15 56. A compound exhibiting HCV protease inhibitory activity, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said compound, and pharmaceutically acceptable salts or solvates of said compound, or of said prodrug, said compound being the compound of structure shown below:

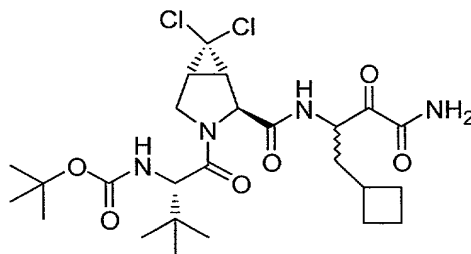




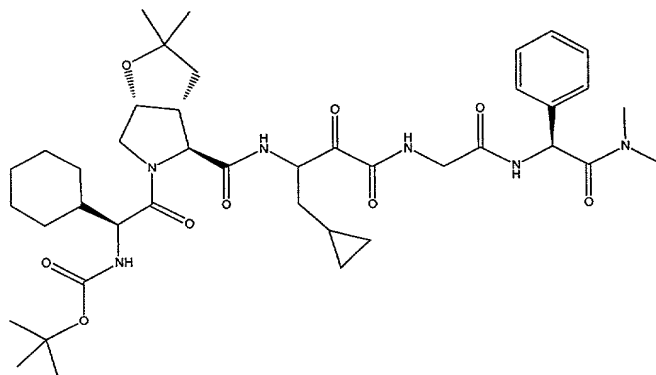
57. A compound exhibiting HCV protease inhibitory activity, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said compound, and pharmaceutically acceptable salts or solvates of said compound,  
 5 or of said prodrug, said compound being the compound of structure shown below:



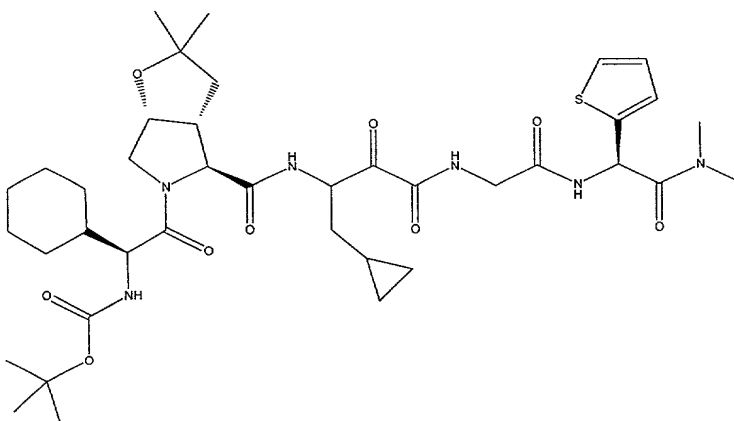
58. A compound exhibiting HCV protease inhibitory activity, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said compound, and pharmaceutically acceptable salts or solvates of said compound,  
 10 or of said prodrug, said compound being the compound of structure shown below:



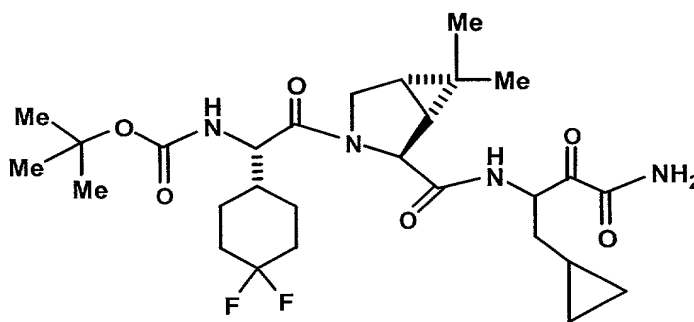
59. A compound exhibiting HCV protease inhibitory activity, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said compound, and pharmaceutically acceptable salts or solvates of said compound,  
 15 or of said prodrug, said compound being the compound of structure shown below:



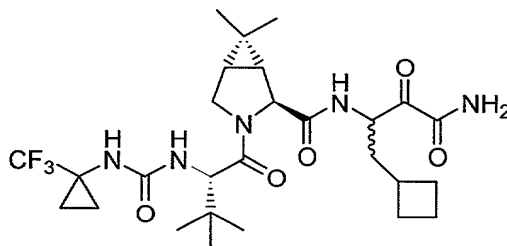
60. A compound exhibiting HCV protease inhibitory activity, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said compound, and pharmaceutically acceptable salts or solvates of said compound,  
 5 or of said prodrug, said compound being the compound of structure shown below:



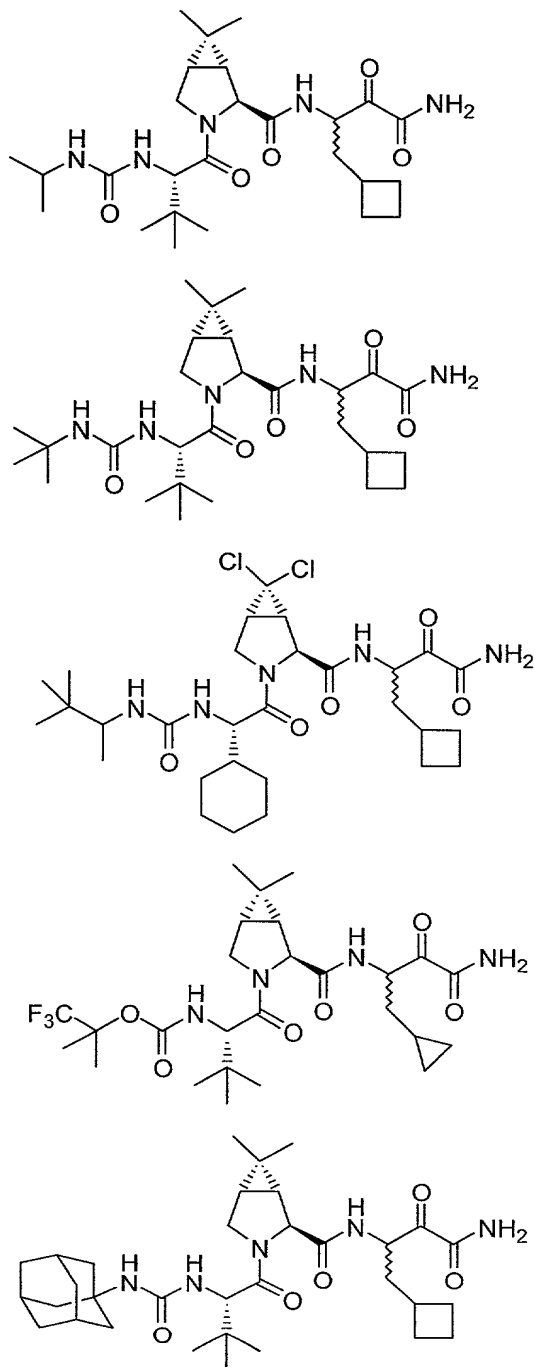
61. A compound exhibiting HCV protease inhibitory activity, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said compound, and pharmaceutically acceptable salts or solvates of said compound,  
 10 or of said prodrug, said compound being the compound of structure shown below:

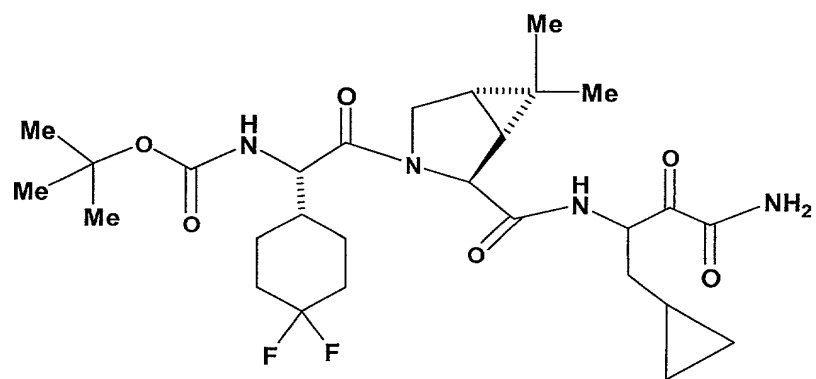
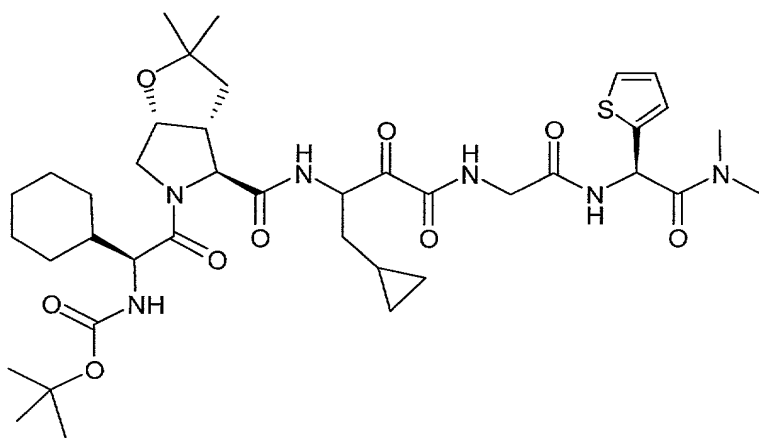
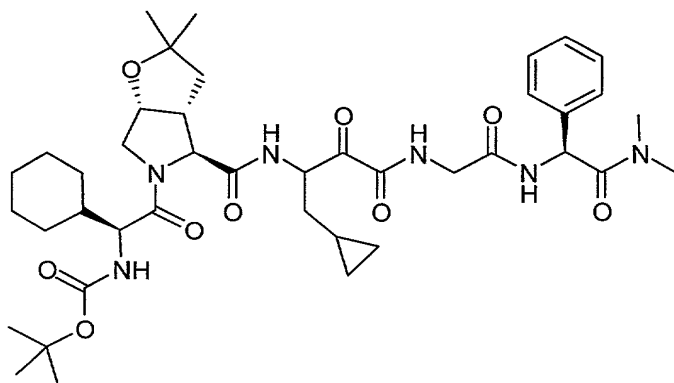
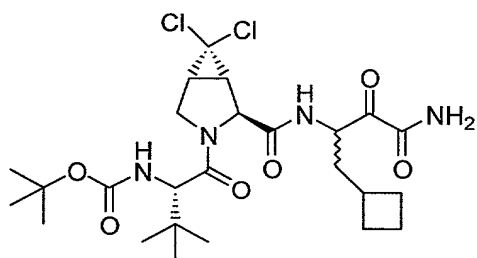


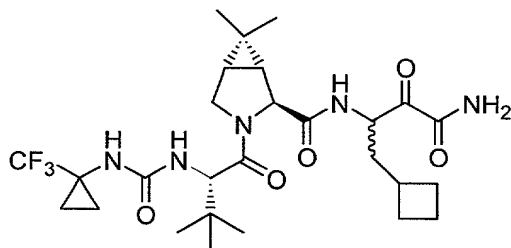
62. A compound exhibiting HCV protease inhibitory activity, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said compound, and pharmaceutically acceptable salts or solvates of said compound, or of said prodrug, said compound being the compound of structure shown below:



63. A pharmaceutical composition comprising as an active ingredient a compound, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said compound, and pharmaceutically acceptable salts or solvates of said compound, or of said prodrug, said compound being selected from the following:





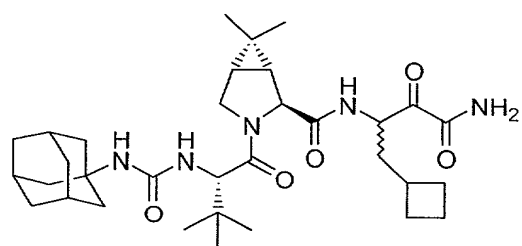
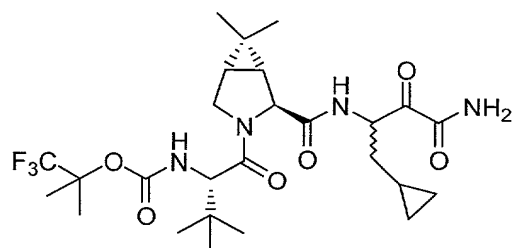
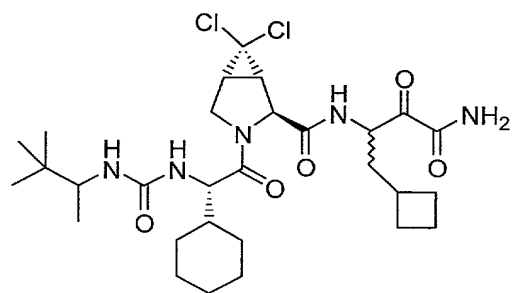
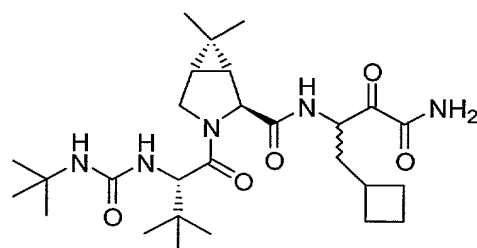
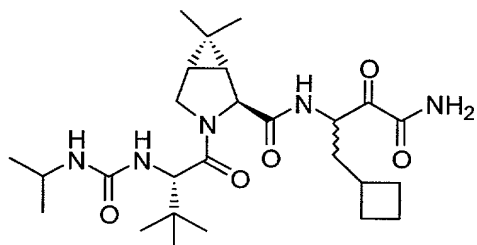
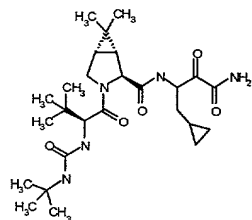


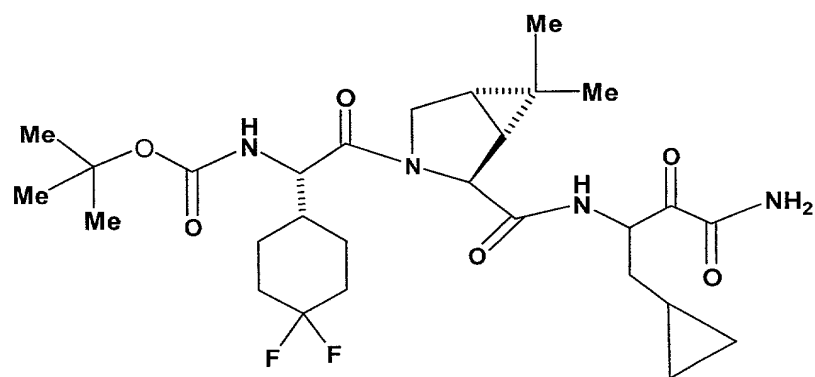
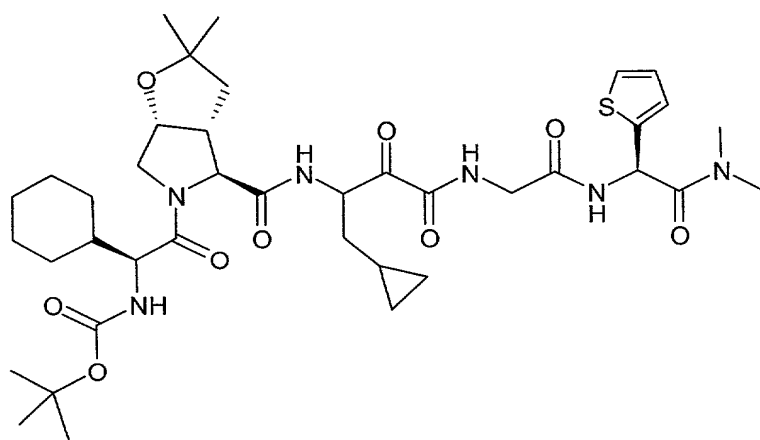
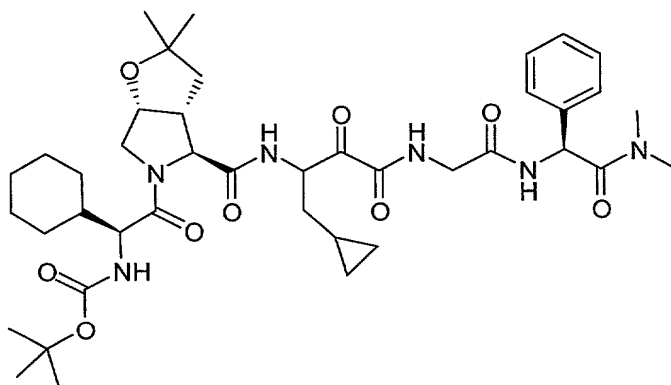
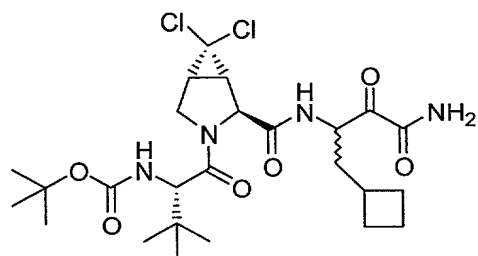
63. The pharmaceutical composition of claim 62, additionally containing an antiviral agent.

64. The pharmaceutical composition of claim 63, still additionally containing an interferon or PEG-interferon alpha conjugate.

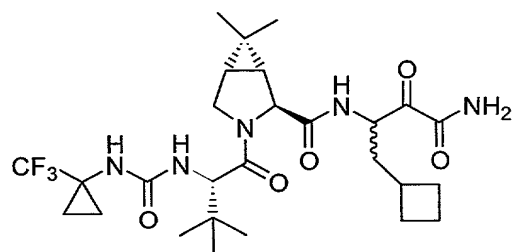
65. The pharmaceutical composition of claim 64, wherein said antiviral agent is ribavirin and said interferon is  $\alpha$ -interferon.

66. A method of treating disorders associated with the HCV, said method comprising administering to a patient in need of such treatment, a pharmaceutical composition which comprises therapeutically effective amounts of a compound, including enantiomers, stereoisomers, rotamers, tautomers, racemates and prodrug of said compound, and pharmaceutically acceptable salts or solvates of said compound, or of said prodrug, said compound being selected from the following:







[illegible]